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# Railway Age Gazette

FIRST HALF OF 1917—No. 10 SIXTY-SECOND YEAR

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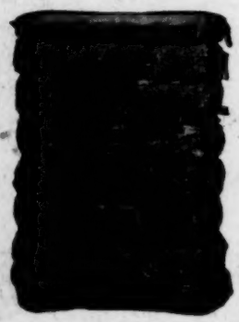

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### The Failure of Recent Railroad Financing

The Southern Railway had planned to put into effect a new comprehensive method of financing its future needs and to issue, under a new mortgage, sufficient bonds to refund maturing issues of notes and to provide money to carry out the additions and betterment program on which the company has been at work for a number of years. This plan has had to be temporarily abandoned. The New York Central offered $25,000,000 stock to its stockholders at par at a time when the stock was selling above par, but although some stock was subscribed for, the price on the New York Stock Exchange declined to below par and the company has had to abandon the sale and to return to subscribers their first payments. In other words, just when things were looking a little brighter and hopes were entertained that by a sound and conservative policy new money could be obtained for much needed addition and betterment work and expansion of facilities to meet the present great volume of business, two sound and conservative plans of financing had to be abandoned. While there are probably a large number of contributing causes, the two most important are, on the one hand, the reluctance of bankers to permit their clients to go into any new venture, with the present uncertainty as to whether or not the United States will enter the war, and, on the other, the evidence which is being presented by December and January earnings, that while the volume of railroad business is being maintained, operating costs are running up to such an extent that net may show a sharp decline. This suggests even to the banker and investor that a mere increase in gross volume of business for the railroads is not going to solve the railroad problem in the United States.

### Sensible Co-operation Results in Better Service

One of the main causes of late trains and a not infrequent cause of train accidents is the attempt of railways having long lines between important terminals to run passenger trains on the same schedules between these terminals as roads having shorter lines. In many cases less competition and more co-operation would result in more economical operation, and at the same time in better service to the public. A good illustration of this is afforded by an arrangement recently made by the St. Louis-San Francisco and the Missouri, Kansas & Texas for rendering through passenger train service between St. Louis and Dallas, Fort Worth and other points in Texas. The Missouri Pacific, the Texas & Pacific and the International & Great Northern have a fine train between St. Louis and Texas points known as the "Sunshine Special." The distance via this route from St. Louis to Dallas is 708 miles, and the running time 18½ hours. The Missouri, Kansas & Texas sought to make the same time between the same points with its "Texas Special," but the difficulties of competing were great because its line between the points mentioned was 767 miles long. Recently the Missouri, Kansas & Texas has made an arrangement with a competing line, the St. Louis-San Francisco, under which the latter road operates the "Texas Special" from St. Louis to Vinita, Okla., and the Katy handles it the rest of the way. This effects a reduction of 79 miles in the mileage covered by the "Texas Special" between St. Louis and Dallas. The result is that not only the competition between the two trains becomes closer, the cost of operating the "Texas Special" is reduced and the service rendered to the public is improved. The entire elimination of competition in railway service is undesirable, but this case is an excellent illustration of the fact that in many instances competition may be modified or supplemented by co-operation in such a manner as to be beneficial all around.

### Support the Storekeepers' Association

On another page of this issue we print a letter from Mr. Summerhays, the president of the Railway Storekeepers' Association, dealing with the activities of the association. We hope his letter will be given careful consideration by our readers. The work of the associations of railway officers is recognized as being of great value in improving the performance of the various departments, but in spite of this fact many of the organizations are hampered by the difficulties which are encountered in financing their business, even though the expenditure is by no means large. The officers of these organizations should not be harassed by financial difficulties, and on the other hand, the membership fees should be kept as low as possible to encourage a large number to take an active

part in their affairs. The reports of the proceedings of the annual meetings, which are usually published in book form, contain information of value to a large number of men who are not members of the organizations, yet their circulation is often confined almost exclusively to the members. A larger sale of the books published by the associations would enable them to carry on their researches more effectively, and those who derive benefits from the work should realize that it is their duty to give it their support. A case in point is the Railway Storekeepers' Association, which has accomplished a great deal in a quiet way, the expense being borne almost exclusively by the members. The association's achievement in standardizing the classification of material, methods of accounting, etc., has been of great assistance to the railroads. The annual proceedings contain much valuable information and a large sale of these books would assist the association in carrying on its work, which is restricted because of the cost involved. It is to be hoped that Mr. Summerhays' communication will result in the organization being given the hearty support which it deserves.

## THE REDUCED SUPPLY OF TRACK LABOR

FROM present indications the shortage of unskilled labor on the railways this season will exceed that of any previous year. Two years ago, when labor and materials were plentiful, the roads did not have funds to justify other than routine expenditures. Now when their earnings have risen to the point where they are able to undertake much work adequate labor is not to be had. The problem this year is not that of securing the funds necessary, nor primarily that of securing materials, even though deliveries are seriously delayed, but of getting enough men to do the work authorized.

Most of the causes of this condition are well known. The industrial expansion, the attracting of men from track work into factories, and the present general industrial unrest are familiar to all. Another factor which will affect the situation adversely in the near future is the new immigration bill with its literacy test which was recently passed over the President's veto, and goes into effect on May 1. It is estimated that the provisions of this law will bar at least 30 per cent of the immigrants coming to this cuntry, while this ratio will be much higher among those commonly employed in track work. By the provisions of the act over 35 per cent. of the Italians and over 50 per cent. of the Mexicans coming to this country last year would have been refused admittance. Consequently the effect of this law will be to prolong the present shortage of track laborers even after industrial conditions have become more normal.

This condition is leading to a rapid increase in wages, $2 to $2.50 now being commonly paid for track laborers. As the season advances it is probable that these rates will rise even higher, for some roads will bid against others for men and demoralize the entire market. If the roads would realize that they cannot meet outside competition for labor, and that any advantage which they may secure by attracting men from neighboring lines is but temporary, they would abandon the practice of bidding against each other. With the wages now paid to track labor as much below those paid in other industries as they now are, the roads cannot hope to attract any considerable number of new men into railway service with any increases which they can reasonably afford to pay.

A more rational plan is to start work as early in the season as possible. Here the engineering and maintenance officers are dependent upon the authorizations of the executive officers. While desirable any year, it is absolutely essential this year that work be started just as soon as weather conditions will permit in order to get as much done as possible before the labor shortage becomes more acute. Another means of increasing the amount of labor is to give increased attention to the care and comfort of the men through the provision of more sanitary camps and closer supervision of the food furnished. It is entirely natural in a year such as this that laborers will go in largest numbers to those roads which provide the best board and camps, and once employed, they can be held longer than in an indifferently conducted camp. Money spent to provide the ordinary comforts and conveniences in the camps will yield larger returns this year when the primary problem is to secure and hold men in the service if the work is to be completed.

The shortage of labor will prove an added incentive for the substitution of labor-saving equipment for men wherever possible. The railways have been backward in this in the maintenance of way department, but increased attention to this subject is now an actual necessity. While meaning a greater initial outlay for equipment in most if not all cases such equipment will decrease the actual cost of performing the work.

## WHY GOVERNMENT MANAGEMENT WOULD FAIL

IN a debate on January 24, several members of the United States Senate presented some of the most conclusive reasons that we have ever read as to why government management of railways, telephones, telegraphs, mines, etc., could not be successful in the United States. Paradoxically enough, they presented these reasons regardless of their several views upon the subject of government ownership. They never mentioned the subject at all. This, however, did not make what they said any less illuminating in its relation to government ownership.

It often has been pointed out in these columns and elsewhere that, theoretically, it might be practicable to effect large economies under government ownership of railways as a result of the consolidation of the roads into a single system, but that what theoretically could be done and what probably would be done are two different matters. Having in mind, now, the question of what probably would be done, let us listen to the senators talk. We shall first hear from Senator Overman of North Carolina:

> Senator Overman—We have just been discussing here the question of the . . . adjustment of office salaries and of the duplication of work. . . . Now, I am going to introduce an amendment which, if adopted, will save this country thirty million dollars. . . . I want the Senate to consider what they are doing, and I ask everybody to listen to the reading of the amendment.

Senator Overman's amendment was as follows:

> "Sec. 8—The President is hereby authorized during the vacation of Congress . . . to transfer and, if deemed desirable, to consolidate bureaus, divisions, offices, and other governmental activities in order that duplication of service may be abolished and extravagance and unnecessary expenditures eliminated."

Senator Gallinger of New Hampshire here "gave expression (we quote from Collier's Weekly's summary of the debate) to the cynicism about economy, which is practically universal in Washington."

> Senator Gallinger—I will ask the Senator from North Carolina in all good faith if he has ever known of an instance where an attempt of this kind has been made when a single clerk was dismissed?
>
> Senator Overman—As the Senator from New Hampshire says and intimates, I have never known one (clerk) to be dismissed, . . . but it is worth a trial.
>
> Senator Gallinger—If the affairs of the Government were placed in the hands of a business man or a business corporation with a free hand, that saving (thirty million dollars) could be made. Under our system, however, it cannot be made and never will be made. . . .
>
> Senator Overman—I think the Senator will also agree with me that there are some bureaus of this Government that might be changed and consolidated with others.
>
> Senator Gallinger—That is my judgment; but I do not believe it will be done.

Mr. Overman is a democrat and Mr. Gallinger is a republican, but there was no difference of opinion between them on the propositions, first, that there is a great duplication of work between different government bureaus, and, second, that no past efforts to effect economies in the departments have ever resulted in the dismissal of a single clerk. The only difference of view between them was as to whether under Mr. Overman's or any other plan any econo-

mies could be made. The opinions expressed by them are not held by them alone. Senator Robinson of Arkansas, and Senator Vardaman of Mississippi, also participated in the discussion.

Senator Robinson—I sincerely doubt whether the system of accounting that prevails in any of the departments could meet the approval of any expert accountant. There is almost unlimited duplication done in the work of these various departments.

Senator Vardaman—I have often been impressed before by the helplessness confessed by the Senate when anything of this character is proposed. The mention of such matters is always accompanied with the statement that we cannot make the bad condition any better—sovereign in power, yet helpless to correct or improve an admitted inefficiency or error.

Why do senators in debates on subjects of this kind always confess their impotency to effect reforms? Senator Robinson of Arkansas explained this.

Senator Robinson—Congress will be besieged by those who have personal interests in the matter, and the result will be that very little will be done. . . . It is very rare indeed, if ever, that Congress abolishes a bureau or abolishes an office. The political influences which are constantly brought to bear to perpetuate offices when once created make it a practical impossibility to accomplish the end sought in that way. . . . The reason for this is apparent. Congress is a political body. The abolition of a bureau of the Government must be accomplished in spite of great political influence.

It was necessary to secure the unanimous consent of the Senate to adopt Mr. Overman's proposition. The question was essentially a business one; it pertained to the economy and efficiency with which the government departments are managed; and yet the United States Senate, being a political body, is so run that anyone of its 96 members could veto this plan. Of course, the one objection was forthcoming. It was made by Senator Oliver of Pennsylvania, on the ground that the "amendment confers powers upon the President that Congress should hesitate long before conferring." Can anyone imagine the board of directors of a railroad or any other kind of business concern dealing with a business matter in this way? The debate continued:

Senator Overman—I regret that there is a member of the Senate who would make a point of order . . . when it was admitted, even on the other side of the Chamber by a former leader of this body (Senator Aldrich of Rhode Island), that we are spending $300,000,000 more annually in the conduct of the affairs of the Government than we ought to spend. For 30 years we have been trying to do something and have not been able to do it. The best thing I can do now is to try to get a report, and then let us see if Congress will act, but they will not act.

Senator Oliver—I will not confer upon the President of the United States or upon anyone else the power to do away with any bureau or to restrict any of the executive departments as they have been established year after year and term after term by Congress.

Let the reader imagine that we have adopted government ownership of railroads in this country, and let him then try to imagine how the roads would be managed with Congress dealing with the railroad department as the senators admit that it now deals with the other government departments. Under private ownership the stockholders elect the board of directors; the directors choose the executive officers, and the executive officers on practically all railways are given a free hand and very wide discretion in the administration of the properties. This is necessary because conditions in the railway business change constantly, and to secure the greatest efficiency and economy it is essential constantly to adapt the physical plant, the organization, the personnel and the methods used to changing conditions.

Under government ownership, on the other hand, if we may judge by the way the present departments of the government are run, Congress would neither effect needed economies itself nor give the executive department the authority to do so. Senators would be heard admitting that there was enormous waste in the management of the railroads, and at the same time confessing that they were powerless to remedy the situation. Senator Robinson, in summing up the reasons for conditions with respect to the existing government departments, also stated the case against government ownership of railways and other public utilities with great force. "Political influences which are constantly brought to bear to perpetuate offices when once created make it a practical impossibility" to accomplish any change which will affect anybody's job. "The reason for this is apparent. Congress is a political body."

## THE MOUNT UNION COLLISION

THERE is one rule in every rule book on every American railroad which has remained substantially unchanged from the beginning,—"In case of doubt, take the safe course; run no risk." (No. 106, Standard Code.) According to the record as it now stands, the terrible collision at Mount Union, Pa., on February 27, was due primarily to disregard of this rule. The engineman saw a white light; the fireman and a brakeman saw a green one, and they "called" it. This raised a doubt which demanded that the brakes be applied at once; or at least that the speed be reduced (from about 40 miles an hour) soon enough to enable the train to be stopped at the next signal, about 4,000 ft. ahead. To run this distance took approximately a minute and a half. Half of this time—45 seconds—would be a sufficient length of time to make the stop, so that there was a period of perhaps 45 seconds in which to consider the doubt; to decide whether it was a doubt, and act according to the decision.

To the railroad officer who seeks to apply the lesson of this collision to his future problems, the first question is, Can I secure and maintain constantly a force of enginemen, firemen and brakemen whose wits and consciences can be depended on to settle such problems in 45 seconds? A problem it is, with many unknown quantities. Cases arise where the time available is less than 45 seconds. Sometimes the engineman has not fully learned the lesson of quick thinking; most of them who do think quickly have learned the habit by long experience. (This engineman had been promoted from fireman about 13 months since, but had had a few months experience as runner in 1913.) The fireman sometimes lacks brightness in this direction. Sometimes he is too much in fear of an overbearing engineman to assert himself. "Fear" is perhaps a strong word in this connection; but a very little of that quality often is enough to make a man hesitate 45 seconds, or longer. Theoretically, this fireman should have applied the brakes, even if, to do so, he had been obliged to knock the engineman off his seat. The brakeman is liable to all the infirmity or dullness of the fireman and, in addition, feels, naturally, *third* in responsibility instead of *second.*

The flagman of the preceding train also was in doubt; in doubt as to how long before his train would start. He remained in doubt, apparently, for 10 minutes or more. This kind of dereliction on the part of flagmen is, however, so common, that it need not be discussed here. One of the most astute general managers in the country remarked, some 15 years ago, that his flagmen no longer flagged; and he was extending and perfecting the block system with this fact in view. But the block system, speaking of American railroads generally, is not yet so perfected that we do away with flagging; and the effort to make flagmen flag is still kept up; and with increased energy and persistency. The cold fact is that, notwithstanding the progress made in safe train running in these 15 years, it is still possible that a score of passengers, sleeping in one of the strongest cars ever built, can be killed in three seconds! The Pennsylvania Railroad had not killed a passenger in a passenger train for over four years; but any one disposed to take too much comfort in that record should look at the record of Great Britain. For nearly two years the millions of passengers of the whole United Kingdom were carried without a single fatality; and this good record was later repeated; yet in May, 1915, at Gretna, over 200 passengers were killed in one collision.

In intelligent activity in securing competent men, in training them to do their duty, and educating them to think quickly, the Pennsylvania Railroad is, undoubtedly, in the front rank of American railroads. It has pursued a consistent policy in this respect for a longer time than any other prominent road, and has done many things regardless of expense where most roads pursue a policy less far-sighted and confident. So that if it claims to be the best managed

road in the country, in this respect, nobody is in position to deny the claim. If this road has put forth its best efforts and still falls so far short, what is to be done? The public feels, no doubt, the same horror and discouragement that it felt in 1887, in 1906 and 1912, when disasters much like Mount Union came in twos and threes, or worse; and the public is more intelligent now than it was in former years.

Intelligent or unintelligent, the public will demand, anew, the automatic stop. People realize that it is a question between perfect men and a perfect mechanical device; and knowing something of the obstacles to securing perfection in enginemen's mental acts and habits; and being educated to believe that the American inventor can do *anything*, they call for the mechanical safeguard.

This disaster presents the issue very clearly. The engineman and the fireman are not only the products of a careful system; by the usual standards they would be classed as creditable products. They are clearheaded, free from objectionable qualities and impress the observer as honest men, devoted to doing their duty. The officers of the company give them a good character. If this system of education and discipline will not insure safety, what system will?

The successful use of stops on the New York subway, and on a number of electric roads, raises a presumption in favor of the principle (backed by 12 years' experience) which the railroads are bound to acknowledge, or to show unfounded. Asserting the use of stops to be unwise on their lines, they have a duty to prove their case more convincingly than they have done thus far. The difference between the subway lines and the ordinary steam road is not well understood by congressmen, editors and others. The example of the Chicago & Eastern Illinois in using an automatic stop for years, with satisfaction, and yet not succeeding in popularizing it is, to the public, confusing. The facts ought to be explained. The experiments which have been made here and there during the past five years, have failed to afford the public much enlightenment. The government has pursued a rather perfunctory course, and the railroads have seemed to be very unsympathetic. The inventors, as a whole, have given us wheat and chaff badly mixed, and no responsible power has done any satisfactory sifting of the mess, or even begun the job.

This situation calls loudly for co-operative, constructive action. And do not railway officers aim at the highest safety of their trains, without regard to what the public asks for? They do, undoubtedly. But, according to the attitude of the governments, state and federal, as judged by their past conduct, a railroad which should spend five million dollars —a thousand or two thousand dollars a mile—to safeguard its trains from one single danger—that of rear collisions—would have to raise the needed money by selling stock or bonds; and then it would be forced to wait, perhaps two to five years, until the situation could be made clear to commissioners, legislators and courts, before it could begin to recoup itself for the expenditure. This necessity of waiting a long time does not excuse the killing of passengers; but it helps to explain why the automatic stop problem has baffled so many.

## BUYING MACHINE TOOLS

THE progress made in the past few years in the machine tool industry has been such that any purchaser of machine tools must study the entire field carefully before buying, in order to make sure he obtains the proper tool for his particular purpose. It is no longer desirable to simply specify a tool of certain general dimensions. The individual features of tools of the same type made by different machine tool manufacturers are such that it is almost necessary for a purchaser to specify definitely which make of tool he desires. In the railroad business this means that the purchase of machine tools should not be placed entirely in the hands of the purchasing department. That department should serve simply to obtain the prices for the different makes of tools specified by the mechanical department. The final selection should be made by the mechanical department, due consideration being given, of course, to the price of the machine, its adaptability to railroad work and the service it is expected to perform. The practice of giving blanket orders for the entire tool list is open to criticism unless the mechanical department reserves the right to specify definitely what machines shall be bought. If this is not done, an opportunity is left for the agencies to fill some parts of the order with tools in which they are especially interested and which may not be entirely suited to the work for which they are purchased.

Adequate shop equipment has become so important that some roads detail a special man to study the machine tool needs of their shops. It is the duty of this man to familiarize himself with the machine tool market, so that the proper tools may be selected when new ones are to be purchased. Such a man is an important factor in any mechanical department organization. The results of his work will be reflected in the cost of shop operation and the output of the shops. One road in particular, places all of its machine tool purchases in the hands of a machine tool committee composed of the general piece work inspector as chairman, and the men in charge of the two important shops on the system as the other two members. This committee determines what new tools shall be bought and in what shops they can be placed to the best advantage. If a machine tool is to be transferred from one shop to another it is only done so on the order of the committee. The chairman being in close touch with the work of the shops, is in an excellent position to study the entire field and from the reports of his assistants he can determine what kind of tools are most needed.

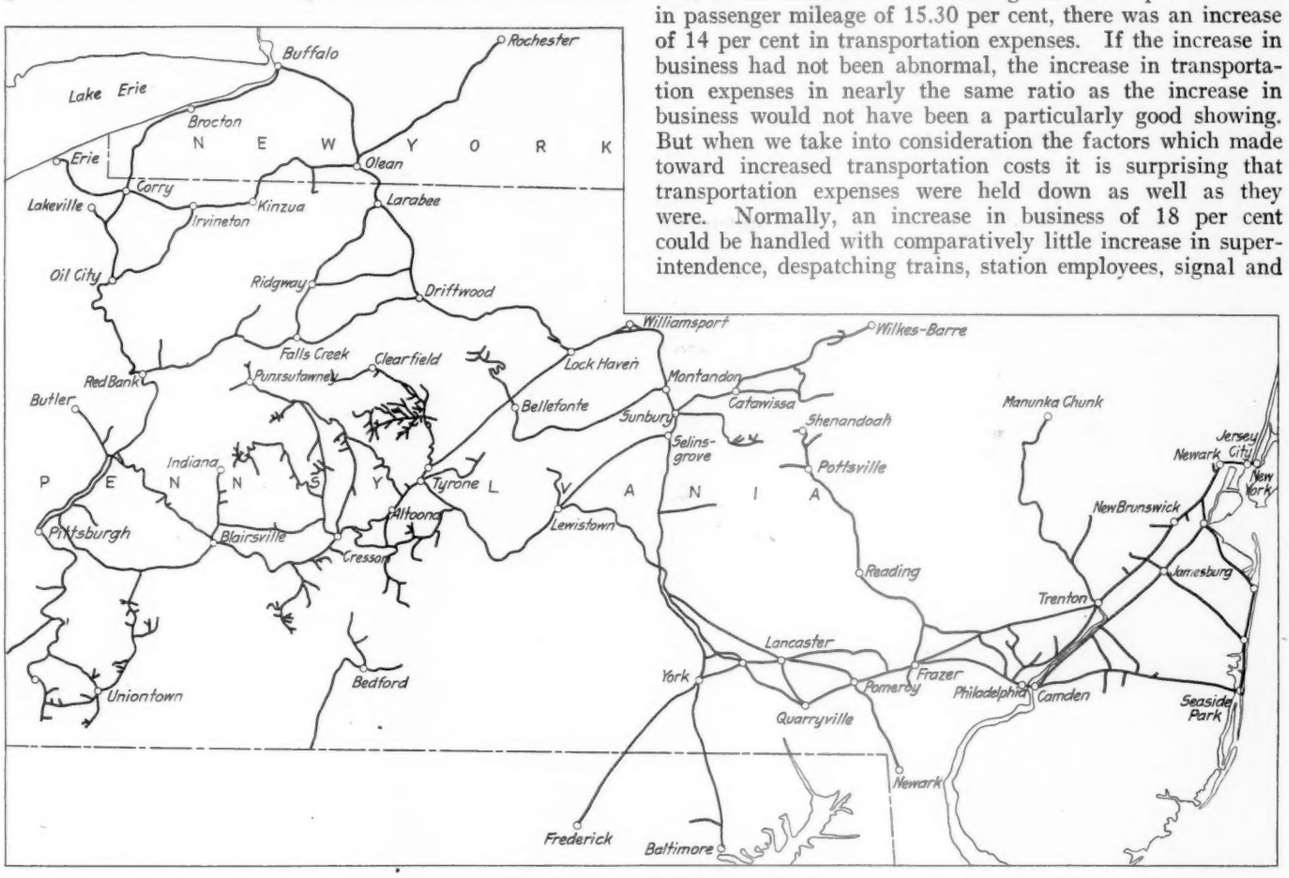
No matter how large or how small a machine tool purchase is to be made, the extensiveness of the field at the present time demands that the most careful consideration be given to the selection of tools.

## PENNSYLVANIA RAILROAD

THE organization of the Pennsylvania Railroad has been criticised as being top-heavy and rigid. In a year of unprecedented stress, however, the Pennsylvania organization showed itself capable of meeting the demands put on it in a way that proves conclusively the groundlessness of such criticism. The Pennsylvania's physical facilities have not a large margin between capacity and the normal business carried, so that with the very abnormal business of 1916 every bit of work of which the plant was capable had to be gotten out of it. Where some of the other eastern roads, with a much larger margin between capacity of plant and normal business, broke down under the strain of 1916, the Pennsylvania stood up wonderfully well. There was congestion especially at the Atlantic seaboard and at junction points; officers were overworked, and the stress was felt, of course; but taken on the whole, the results of the year's work are a magnificent tribute to Pennsylvania organization and Pennsylvania foresight and liberality in providing facilities in past years when both organization and facilities would have looked adequate to a less farseeing management.

The Pennsylvania Railroad, operating 4,536 miles of line, earned gross in 1916 $230,279,000, an increase as compared with the previous year of $33,650,000. With an increase of $23,428,000 in expenses and an increase of $1,428,000 in taxes, the company was able to show net income available for dividends of $52,277,000, or $9,851,000 more than in 1915. The regular 6 per cent dividends were paid and the remainder of the profit was invested in the property. Even in 1916, however, the net operating income represented a return of only 5.35 per cent on the total previous investment in the property, which, when compared with the profits being made by the manufacturing concerns in 1916, seems absurdly meagre.

In studying the results of the year's operations it must constantly be borne in mind that expenditures to provide facilities for increased business on a great railroad system like the Pennsylvania's must be begun from five to seven years before the time when the increased facilities will be imperatively needed. The Pennsylvania has been wonderfully far-sighted in providing for future needs. Time and again its program of additions and betterments has been criticised as providing for possible future needs too far ahead, but in 1916 the business flowed in on the lines, filling up every crevice of spare capacity in a way that dwarfs in retrospect the provisions which had been made. It would be absurd to say that in 1916 the Pennsylvania had sufficient facilities to give shippers satisfactory service. That would have been a mistake in judgment on the part of the management to attempt to provide facilities which would be entirely adequate in a time of abnormal peak load. But what can and should be done is that the Pennsylvania policy, pursued for so many years, of preparing years in advance for growth of business, should continue to be carried out. The Pennsylvania management may be trusted to continue its well established policy if it can raise the money necessary to do so, and whether or not it can raise the money will depend to a very large extent on the course which is taken by state and federal regulation of railroads.




**The Pennsylvania Railroad**

The Pennsylvania and other railroads are like the salaried man in the present high cost of living. Unless a raise in salary can be obtained, a lower standard of living becomes inevitable; but the public don't want a lower standard set by the Pennsylvania. The trouble seems to be that the public does not really care to face the facts squarely. In 1916 the Pennsylvania made a magnificent showing, but will it in 1917? Even in the last two months of 1916 costs were rising at an alarming rate. There is a limit beyond which no organization can be pushed. Unless changes, which cannot be foreseen now, take place, no such good showing in regard to operating expenses can be made this year as were made last year.

Total operating expenses in 1916 amounted to $166,165,000. The increase of $23,428,000 over the previous year was accounted for by approximately $11,600,000 more spent for maintenance and $11,744,000 higher cost of transportation. The total ton mileage carried in 1916 was 28,944,000,000, an increase of 3,893,000,000. The number of passengers carried one mile totaled 2,169,000,000, an increase of 288,000,000. The total trainload was 870 tons in 1916, an increase of 55 tons as compared with the previous year. The greater part of the gain in trainloading was due to better car loading. The average revenue per ton per mile was 6.03 mills in 1916, a decrease of 0.07 mill as compared with 1915.

With an increase in ton mileage of 18.02 per cent and in passenger mileage of 15.30 per cent, there was an increase of 14 per cent in transportation expenses. If the increase in business had not been abnormal, the increase in transportation expenses in nearly the same ratio as the increase in business would not have been a particularly good showing. But when we take into consideration the factors which made toward increased transportation costs it is surprising that transportation expenses were held down as well as they were. Normally, an increase in business of 18 per cent could be handled with comparatively little increase in superintendence, despatching trains, station employees, signal and interlocking operation, stationery and printing, etc. Furthermore, the cost per train-mile of enginemen's wages, trainmen's wages, and fuel, water and lubricants ought not to be much higher with a trainload of 870 tons than with 815 tons; but in 1916 conditions were unprecedented. To meet the high cost of living and the competition of other businesses, the Pennsylvania had to increase salaries of train despatchers, officers, clerks, and many other classes of men. Apparently the increases were in the neighborhood of 12 per cent. With the strain put on physical facilities, overtime drove up train-mile costs. The wages and fuel costs per freight train mile (making an arbitrary division of the cost of water, lubricants and other supplies,) was 62 cents in 1916, as against 56 cents in 1915. Under the conditions which these figures reflect, an increase of only 14 per cent in transportation expenses, with an increase of 18 per cent in ton mileage, is a fine showing.

The Pennsylvania management increased its appropria-

tions for maintenance of way and structures almost in proportion to the increase in business. There was spent on this account in 1916 $28,819,000, or $3,491,000 more than in 1915. Maintenance of equipment cost $45,805,000 in 1916, an increase of $7,164,000. The following table shows the percentage of each class of expenses to operating revenue in 1915 and 1916:

| | 1916 | 1915 |
|---|---|---|
| Maintenance of way and structures | 12.52 | 12.88 |
| Maintenance of equipment | 19.89 | 19.65 |
| Traffic expenses | 1.10 | 1.21 |
| Transportation expenses | 34.91 | 34.92 |
| General expenses | 2.39 | 2.58 |
| Miscellaneous expenses | 1.35 | ..... |
| Total | 72.16 | 71.24 |

The Pennsylvania placed orders for locomotives and cars on a very liberal scale until the rise in prices made further purchases almost prohibitive. During the year 264 locomotives, 403 passenger cars and 6,252 freight cars were added to the equipment in service.

To appreciably increase the capacity of a railroad situated as the Pennsylvania is in thickly settled territory, where land values are high and additional terminals fearfully expensive, the cost is enormous. To increase the average capacity of the whole plant by even 5 per cent means an expenditure of a great many million dollars. A mere recitation of the principal improvements made to the property in 1916 conveys no adequate idea of the extent of the work. A total of $28,995,000 was spent for these additions and betterments. This amount would build and fully equip a thousand-mile railroad in the West in normal times. In addition to the enlargement of the facilities at Philadelphia, which work has been going on for some time, work was begun on an enlarged freight yard at Fifty-second street. This yard, which supplements existing yards, will be more than a mile long, have 57 tracks and have a capacity of 3,050 cars. Pittsburgh passenger traffic has already outgrown the facilities there and an enlargement of the passenger and freight station and general office building has been decided on. Larger locomotives have entailed very heavy expenditures for longer turntables and many new bridges; larger capacity cars have entailed the building of new car weighing scales; the main line rail renewal is being done with 125 to 130-lb. rail; telegraph, telephone and signal wires have been placed underground between Jersey City, N. J., and Princeton Junction, and between North Philadelphia and Broad street station.

The Pennsylvania is planning to electrify its main line across the Allegheny mountains between Altoona, Pa., and Conemaugh, but the only progress made during the year was the designing and construction of an electric locomotive for this service. The Pennsylvania is, of course, studying the results which are being obtained by the Norfolk & Western and the Chicago, Milwaukee & St. Paul on their electrified lines.

Up to the present the Pennsylvania station in New York City has been disadvantageously located as compared with the New York Central's Grand Central terminal. A subsidiary of the Pennsylvania owns the land on Seventh avenue facing the Pennsylvania station and for six years the company has tried to get some one else to build a large hotel on this land. The management, however, has decided to build the hotel through a subsidiary, and a 2,000-room hotel, to cost $9,500,000, exclusive of the land, has been contracted for. This hotel will adjoin the new four-track Seventh avenue subway which is being built by the city and the Interborough Rapid Transit, and it may quite well be that in a few years almost as great a change will take place in the character of the business in the neighborhood of the Pennsylvania station as has taken place in the past five years in the character of business on Forty-second street.

The following table shows the principal figures for operation in 1916 as compared with 1915:

| | 1916 | 1915 |
|---|---|---|
| Mileage operated | 4,536 | 4,541 |
| Freight revenue | $164,206,792 | $140,654,857 |
| Passenger revenue | 44,907,477 | 38,611,086 |
| Total operating revenue | 230,278,533 | 196,628,170 |
| Maintenance of way and structures | 28,819,322 | 25,328,513 |
| Maintenance of equipment | 45,805,126 | 38,641,078 |
| Traffic expenses | 2,534,360 | 2,386,064 |
| Transportation expenses | 80,394,314 | 68,650,005 |
| General expenses | 5,509,430 | 5,077,755 |
| Total operating expenses | 166,164,582 | 142,736,561 |
| Taxes | 64,113,952 | 53,891,609 |
| Operating income | 55,056,011 | 46,250,925 |
| Gross income | 78,220,874 | 66,626,245 |
| Net income | 52,276,504 | 42,425,322 |
| Sinking and reserve funds | 2,138,959 | 1,946,341 |
| Dividends | 29,952,252 | 29,952,219 |
| Appropriated for additions and betterments | 9,214,925 | 7,286,850 |
| Construction expenditures on leased lines | 3,713,786 | 3,239,913 |
| Surplus | 7,256,582 | ..... |

## BUFFALO, ROCHESTER & PITTSBURGH

THE Buffalo, Rochester & Pittsburgh is the first railroad company to issue a report for the six months ended December 31, 1916. The Interstate Commerce Commission changed the period for making reports to it from the June 30 fiscal year to the calendar year. This will necessitate a six months' report to the commission and the Buffalo, Rochester & Pittsburgh promptly changed its period for making reports to stockholders, which change will probably be followed by many other roads.

Many people are under the impression that in the last six months of the 1916 calendar year the railroads were earning more profit than ever before in their history. As a matter of fact, however, expenses were mounting very rapidly during that period, and while the Buffalo, Rochester & Pittsburgh shows a very substantial margin above its dividend payments (there was $864,000 surplus available for dividends for the last half of 1916 as against $696,000 for the last half of 1915, and the 3 per cent dividends for the half year on both the preferred and common stock called for $495,000) for the six months June 30, 1916, to December 31, its report shows also how serious is this increase in the expenses of operation.

Total operating revenues in the six months ended December 31, 1916, amounted to $6,769,000, comparing with $5,978,000 in the corresponding six months of 1915. Total operating expenses amounted to $5,026,000, comparing with $4,285,000. Approximately the same was spent for maintenance of way, but an increased appropriation was made for maintenance of equipment in accordance with the policy of making extraordinary expenditures for rebuilding freight cars with steel underframes and bolsters and equipping them with heavy draft gears.

Transportation expenses amounted to $2,269,000 in the 1916 six months, an increase of $484,000 over the 1915 six months. This is an increase of 27 per cent. The increase in ton mileage of freight amounted to 14.04 per cent, the ton mileage carried in the last six months of 1916 being 1,266,600,000.

In the last six months of 1915 the Buffalo, Rochester & Pittsburgh was operating under conditions which were peculiarly favorable for making a good showing in transportation expenses. As the volume of business carried by a railroad mounts from a previous low ebb, it is always possible to get more business done for a while with the same operating force. In the last half of 1915 the Buffalo, Rochester & Pittsburgh was receiving a steadily increasing volume of business and its forces had previously been cut down to meet the depression of the year before, so that only the more efficient men were in service. In the last half of 1916, however, conditions were radically different. The Buffalo, Rochester & Pittsburgh, like the Pennsylvania, found that it was necessary to increase the pay of a great many men in order to hold them and to meet the great increase in the cost of living. The detailed figures for trans-

portation expenses bear this out. Station employees were paid $222,000 in the last half of 1916, or approximately $50,000 more than in the last half of 1915. Yardmasters and yard clerks were paid $48,000 in 1916, an increase of nearly $10,000. Train enginehouse expenses amounted to $122,000 in 1916, an increase of $43,000 over 1915.

Trainloading was not as good in the last half of 1916 as in the last half of 1915, being 792 tons (revenue freight) as against 814 tons in 1915. In the last half of 1916 the tonnage of iron ore amounted to 445,000, a decrease as compared with the corresponding six months of 1915 of 21,000 tons. This is a very small percentage of decrease, but it must be remembered that the loss of every carload of iron ore subtracts just that much from the trainload southbound,

**The Buffalo, Rochester & Pittsburgh**

the iron ore being loaded into gondola cars which move to the lake loaded with coal. The car has to make the return trip and if iron ore is not available it must be moved southbound empty.

There was no necessity for the Buffalo, Rochester & Pittsburgh to increase its maintenance of way expenses. The road is so well maintained that it would have been easy to cut maintenance of way expenditures for a very considerable period, but as a matter of fact, even in 1914 no drastic cut was made and in 1915 the company was spending a liberal amount on its roadway and structures.

The company spent $240,000 in the latter half of 1916 for additions and betterments, the two largest items being for increased weight of rail and yard and siding extensions. No important additions were made to the number of cars and locomotives in service during the last half of 1916, but since December 31, 10 Mikados and 5 Mallets were received by the company and contracts have been made for 30 additional locomotives to be delivered next summer.

No bonds were sold during the last half of 1916 and on December 31 the company had on hand $499,000 cash and $921,000 demand loans and deposits, comparing with $512,000 cash and $909,000 demand loans and deposits on June 30, 1916. There were no loans and bills payable on either date except $9,600 which nominally comes under this head.

The Buffalo, Rochester & Pittsburgh is in an extraordinarily sound financial condition as compared with the majority of American railroads. Its policy in providing equipment has been very liberal indeed. In fact one reason why the Buffalo, Rochester & Pittsburgh is able to compete so successfully with the Pennsylvania Railroad is because of the surplus equipment which it holds ready to meet the needs of shippers. But even the Buffalo, Rochester & Pittsburgh is not going to be able to increase its wage scales, pay war prices for materials and receive less than half a cent a mile for moving a ton of freight and continue indefinitely to add to its facilities through the investment of new money.

The following table shows the principal figures for operation in 1916 as compared with 1915:

| | Six months ended Dec. 31, 1916 | 1915 |
|---|---|---|
| Mileage operated | 586 | 586 |
| Freight revenue | $5,820,360 | $5,165,672 |
| Passenger revenue | 668,733 | 599,274 |
| Total operating revenues | 6,768,749 | 5,978,013 |
| Maintenance of way and structures | 897,549 | 969,577 |
| Maintenance of equipment | 1,627,388 | 1,324,465 |
| Traffic expenses | 79,967 | 69,924 |
| Transportation expenses | 2,268,546 | 2,784,780 |
| General expenses | 143,383 | 128,995 |
| Total operating expenses | 5,025,808 | 4,284,804 |
| Taxes | 132,000 | 120,000 |
| Operating income | 1,609,586 | 1,573,170 |
| Gross income | 2,135,000 | 1,989,408 |
| Net income | 1,083,031 | 917,629 |
| Appropriations | 219,175 | 221,911 |
| Dividends | 495,000 | 390,000 |
| Surplus | 368,856 | 305,718 |

## NEW BOOKS

*How to Protect Your Factory From Fire.* By William Guerin. 77 pages, illustrated, 5¾ in. by 8¼ in. Bound in cloth. Published by the Pyrene Mfg. Co., New York. Price $1.

The contents of this book form a thoroughly practical and complete answer to the question suggested by its title. It is published by a manufacturer of fire extinguishers but its character as an advertisement is modest and inoffensive. The author, for 35 years connected with the fire department of New York City, where he made a notable record for executive ability, is now a lawyer, and is chairman of the fire prevention committee of the Safety-First Federation of America. The book is intensely practical. Every paragraph is terse and direct, so that the whole makes a ready handbook, to be consulted at a moment's notice, if necessary, while yet it is full and detailed, nothing, apparently, being omitted.

*Instructions to Locating Engineers.* By F. Lavis, consulting engineer, New York City. Illustrated. 44 pages. Bound in cloth. Published by McGraw-Hill Book Company, 239 West 39th St., New York. Price $1.

This volume constitutes the publication for general circulation, of instructions prepared by the author for use of field parties working under his direction in the United States, South America and China. The contents of the book may be divided into two classes. Instructions covering the clerical and administrative details of the conduct of a survey, purchase of supplies, administration of the camp, preparation of notes and reports, and a compilation of technical instructions and data which have to do with the actual location of the line. The book will be found valuable to anyone responsible for railway location, either in the preparation of a set of instructions or in the revision of a set of rules already in use.

# Letters to the Editor

## THE ENGINEMEN'S WAGES

New York, N. Y.

To the Editor of the Railway Age Gazette:

In an article on train service in the *Railway Age Gazette* of November 3, "General Manager" compares the pay drawn by a man who is on the road five or eight hours with one who requires ten hours for the trip, but he forgot that with a pool system, first in is first out. Consequently when business is good the man making the fast trips will make the most trips and draw the most money. For this reason on the railway with which I am connected the men like to get over the road as quickly as possible. However, drag freights seldom do better than ten miles an hour on the average because of the large amount of drops and pickups. The management, I presume, believes this more economical than paying less overtime and running an extra train for the drop and pickup business.

As regards seniority, it is not as black as painted. I know of several cases where men who were not giving satisfaction on certain jobs were taken off. There was at one time a rule which provided that firemen taking examinations for promotion who passed at the first trial would rank ahead of those of the same age in service who passed the second trial, etc. The brotherhoods killed this rule, but this seems to be a great mistake, especially from the firemen's point of view.

A Fireman.

## THE RAILWAY STOREKEEPERS' ASSOCIATION

Chicago, Ill.

To the Editor of the Railway Age Gazette:

The Railway Storekeepers' Association has a membership of nearly eight hundred railroad officers and employees, whose duties have to do with the purchase or disbursement of material for railways, and with accounting for same. Though in existence more than thirteen years, it is still showing a steady, healthy growth, and its field of action and influence is being extended each year.

The objects of the association, as set forth in its constitution, are the exchange of ideas as to the betterment in method of handling, caring for and use of material and supplies in connection with the operation of railways, by discussion, investigation and reports of experience of its members, and to provide an organization through which the members may agree on such joint action as may be required to have the greatest efficiency in the method of storing, handling, distribution and caring for material.

The organization was formed in 1904 by a few enthusiastic, ambitious general storekeepers, who, realizing the increasing need of information on the important subject of material and supplies, and the value to railroads of standardizing methods of storing, handling and accounting for material, sought this means of bringing about the desired end. The first meeting of the association was held in Chicago in May, 1904, and regular annual conventions have been conducted during that month each succeeding year.

During the thirteen years of its existence, the association has made very satisfactory progress toward standardizing store department practices on railroads. They have established for general use, a standard material classification, whereby all railroads so desiring may classify material for storekeeping and accounting purposes, so that material reports and statements may be compared in detail with those of other railroads. This has been printed in booklet form for convenient use of stock-keepers, accountants, and others needing it.

A standard classification of railroad scrap has been formulated by the association, and is in general use by railroads and scrap dealers throughout the country. This is of great value in assisting the railroads to prepare their scrap to command the best prices on the market, and puts the purchasing agent in position to make comparisons between prices offered by different dealers.

Standards for the grading and inspection of lumber used by railroads, originating with the Railway Storekeepers' Association, and approved and adopted by the Master Car Builders' Association, bid fair to become the recognized standard with lumber manufacturers and railroads throughout the country.

A set of drawings and specifications for standard tinware for railroad use, which was prepared by the association, has been adopted by the Master Mechanics' Association. This is a step toward simplicity and economy, whereby manufacturers can standardize on their dies, with the result that as the railroads adopt this standard, their purchasing agents will be in position to secure bids from any manufacturer of tinware.

Complete drawings and specifications have been prepared for standard buildings and structures of various kinds required in connection with supply department work. These are of great value to railroads considering the erection of new buildings, and having in their possession no data showing the best practices.

On the handling of stationery much valuable data have been compiled, and standard practices agreed upon.

On reclaiming of material from scrap, this association has compiled complete data, giving the practices on the best railroads of the country, describing operations, showing the cost of same, and saving effected, the report being illustrated by numerous photographs. This is a most valuable work, containing data which should be available on some of our railroads where good material is still allowed to remain in the scrap.

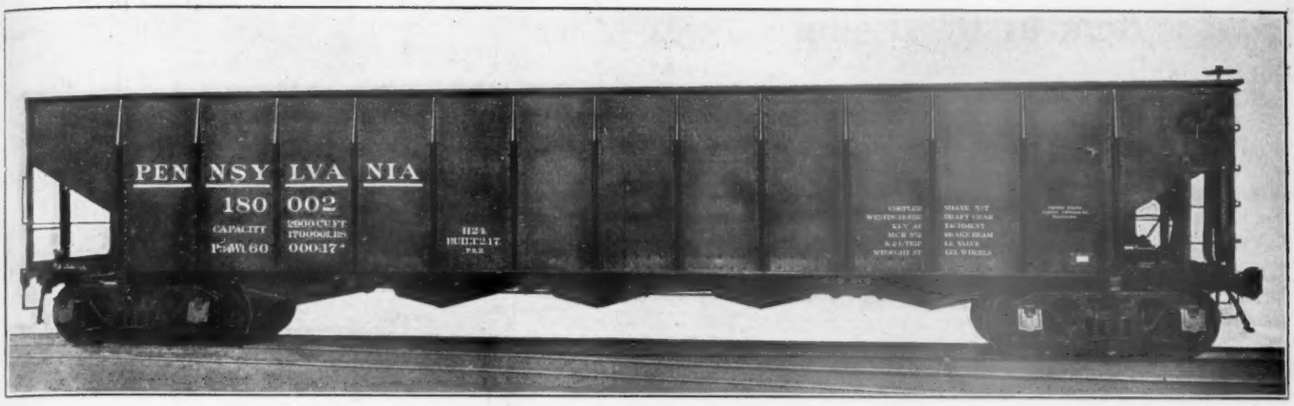
A book of standard rules for store department practices has been compiled, outlining with complete detail the work of the store department on various railroads, with samples of necessary blanks used in storekeeping and accounting work. These rules cover everything in connection with ordering, receiving, paying for and disbursing all railroad material, with provision for such special items as rail, ties, fuel, ice and stationery. Storekeepers in old-established store departments are finding features of interest in this book of rules.

The standing Committee on Accounting has brought in reports from year to year, giving valuable data in connection with accounting for material. The Committee on Piecework has shown clearly the savings to be effected in handling railroad material of various kinds under the piece-work system, and a Committee on Marking of Couplers and Parts has succeeded in compiling an effective plan of numbering the hundreds of different kinds and parts for ready identification.

All of the above data, and many other items of interest to railroad store department employees and to supervising officials, are contained in the cloth-bound books of the Annual Proceedings of the Association. Copies may be had of the Secretary, Box "C," Collinwood, Ohio. The association depends for revenue entirely upon the dues of its members and the sale of these proceedings.

W. A. Summerhays,
General Storekeeper, Illinois Central.

Projected Subway for Madrid.—The Spanish Department of Public Works on January 12, granted a concession for the construction and operation of an underground electric railway system in Madrid. It will be more than 8 miles long and will require a capital of $6,000,000 for its construction. A period of 8 years will be allowed for the completion of the undertaking.



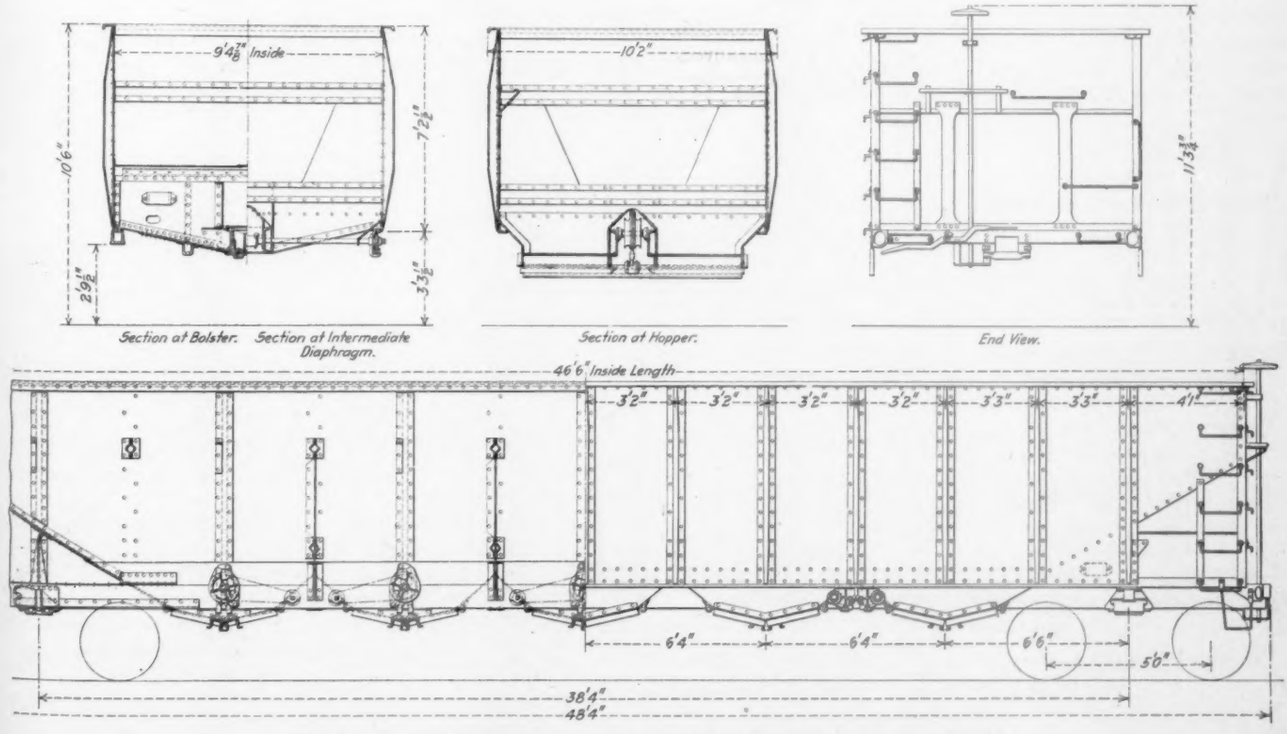

# Eighty-Five Ton Hopper Car for the Pennsylvania

### A Description of an All-Steel Car for the Coal Trade Which Has Five Hoppers and Weighs (Light) 60,000 Lb.

THE Pennsylvania Railroad has gone one step further in the construction of its all-steel hopper cars and is building, at its Altoona shops, a car which has a capacity of 170,000 lb. and a light weight of 60,000 lb. The new design is known as the Class H-24 car and is patterned after the Pennsylvania Class H-21a hopper car, the details of which are interchangeable. In the new car an increase in the cubical capacity has been obtained by the addition of a bay 6 ft. 4 in. long which requires five hoppers instead of four, the number used in the Class H-21a equipment.

The top and bottom members of the sides of the new equipment have been increased 50 per cent in area over that of the old equipment, to take care of the additional load. The general dimensions of the car are as follows:

| | |
|---|---|
| Light weight | 60,000 lb. |
| Length over end sills | 48 ft. 4 in. |
| Length inside | 46 ft. 6 in. |
| Distance, from center to center of truck | 38 ft. 4 in. |
| Width, extreme | 10 ft. 2 in. |
| Width, inside | 9 ft. 4⅞ in. |
| Extreme height from rail | 10 ft. 6 in. |
| Truck wheel base | 5 ft. 10 in. |
| Truck weight | 13,050 lb. |
| Capacity | 170,000 lb. |




**Elevation and Sections of 85-Ton Hopper Car for the Pennsylvania**

| | |
|---|---|
| Cubical capacity: | |
| Level with the top | 2,900 cu. ft. |
| Contents heaped | 328 cu. ft. |
| Total | 3,228 cu. ft. |

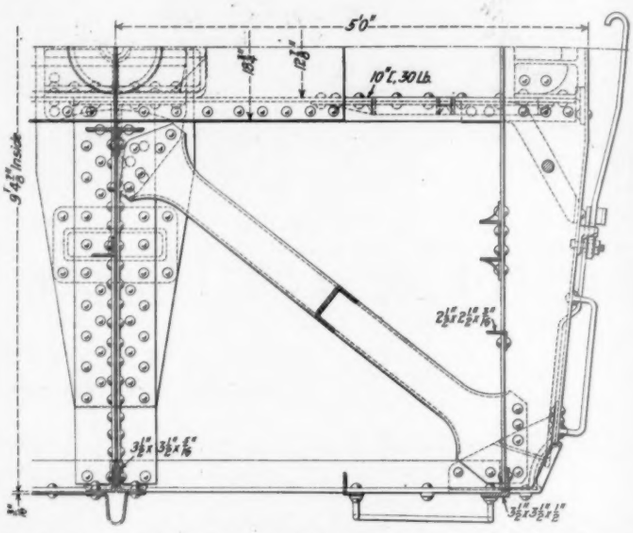
*Underframe.*—The underframe is characteristic of former Pennsylvania designs, having a well-balanced central mem-

ber to absorb the buffing stresses, while the major portion of the load is carried by the side construction. The center sills are two 10-in., 30-lb. channels, 48 ft. ¾ in. long, strengthened latterly by spacers at the diaphragms, as well as by cover plates at either end. Cast steel striking plates join the end and center sills. The center sills are further reinforced by two other steel castings, which extend forward and backward a sufficient distance from the center line of the bolster to form a draft gear stop and act as a spacer for the center sills at the point where the body bolster is joined thereto. The center sill cover plate and bottom reinforcing angles are not continuous on account of the clearance required by the drop door operating device. A U-shape ridge sheet, the four sections of which form a continuous member extending between the end slope sheets, is substituted for a continuous cover plate, and is so attached to the center sill that there is at least 24 sq. in. of metal to resist buffing. The bottom member of the side construction is a 4-in. by 4-in. by ⅝-in. angle. The end sills are pressed Z-shape members.

The body bolster is composed of a ¼-in vertical web plate, cut out over the center sills to permit them to pass through. It is secured at the top to the end slope sheets by two 5-in. by 3½-in. by ⅜-in. angles, 8 ft. 10 in. and 6 ft. 8½ in. long. It is strengthened at the bottom by two 5-in. by 3½-in. by ⅜-in. reinforcing angles, which extend from the center to the side sills. A tie plate passes under the center sills and is riveted to the web plate reinforcing angles on either side, as well as to the center sills, the center sill reinforcing angles and the center sill casting. The center plate is a drop forging.

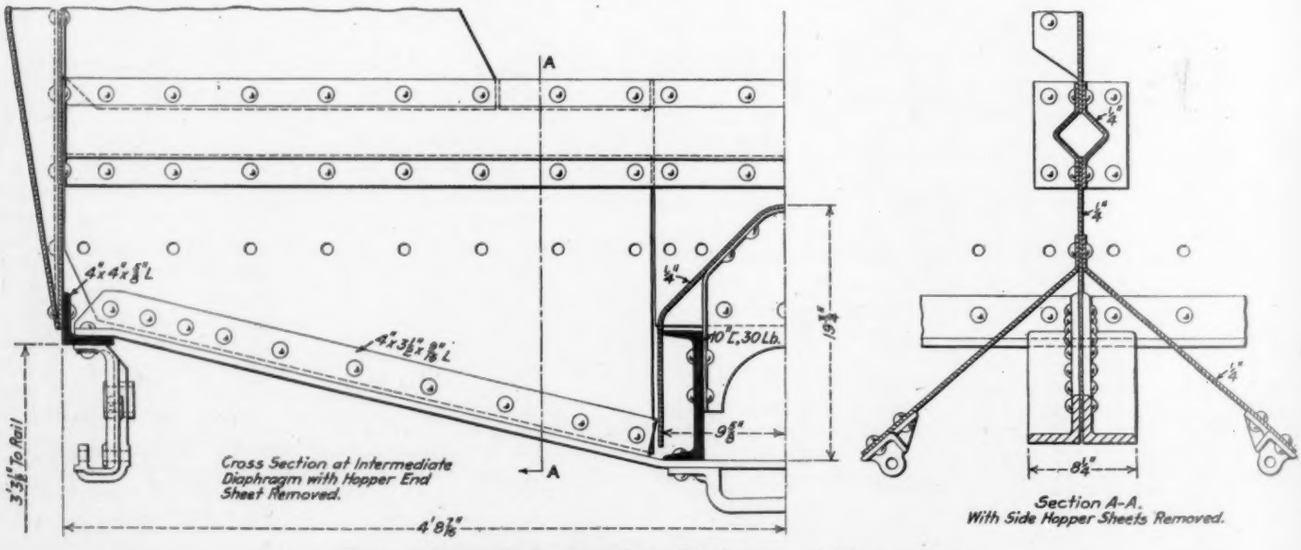
Four intermediate diaphragms located between the five hoppers transfer the major portion of the load from the center to the side construction. The diaphragms, like the bolster, are of the single plate type, which gives the maximum amount of space for the hoppers. The ¼-in. diaphragm sheet is divided into three parts, one on either side of the center sills and the central portion immediately above, all of it are secured the ¼-in. hopper slope sheets, to the lower edge of which the drop door hinge castings are riveted.

*Superstructure.*—The side construction is composed of four distinct members; viz., a 5-in. 19.3 lb. bulb angle, as the top member; a 4-in. by 4-in. by ⅝-in. angle as the bottom member, previously mentioned as part of the underframe; twenty-six vertical U-shape posts spaced 3 ft. 2 in.




**Half Plan of Bolster and End Sill of Pennsylvania Hopper Car**

and 3 ft. 3 in. apart, as the details demand, and 3/16-in. side sheets which connect the other three parts. Alternate posts in conjunction with inside butt strips join adjacent side sheets. The end consists of a 4½-in. by 5-in., 19.3 lb. bulb angle at the top, and a 3/16-in. end sheet connected to the sides by the cast steel corner casting and an angle




**Section Through Intermediate Diaphragm of Hopper Car**

which are joined together by the cross ridge sheets and lower cross ties. The bottom of the web plate is reinforced by two 4-in. by 3½-in. by 9/16-in. angles, the vertical leg of which is cut off at the center sills, allowing the horizontal leg to extend under the sills, thus forming a continuous member from side to side of the car. The top of the intermediate diaphragm web plate terminates between the flanges of a diamond-shaped pressed steel cross brace. Immediately below corner post. The end sheet extends downward 2 ft. 9¾ in. from the top of the bulb angle and is flanged inward at the bottom to support the floor slope sheet. The end floor sheets, ridge sheet and side hopper sheets all slope into the drop bottoms at a sufficient angle to discharge the load when the doors are open.

Eight diamond-shape cross braces, two above each intermediate diaphragm, tie the sides of the car together. These

cross braces are located one above the other at a distance of 42 in., the center line of the top one being 27 in. below the top of car. A vertical ¼-in. gusset plate, 18 7/16 in. wide at the top and 34 in. wide at the bottom, is riveted between the lower flange of the upper and the upper flange of the lower cross brace, as well as to the side sheets, thus adding materially to the stiffness of the superstructure. The car has five hoppers which are divided by the ridge sheet which spans the center sills into two units each. Each unit has a pair of drop doors which are operated by a mechanism controlled from the side of the car. When in the release position they have a maximum opening of 3 ft. 5½ in. by 2 ft. 11 3/16 in. per pair of doors.

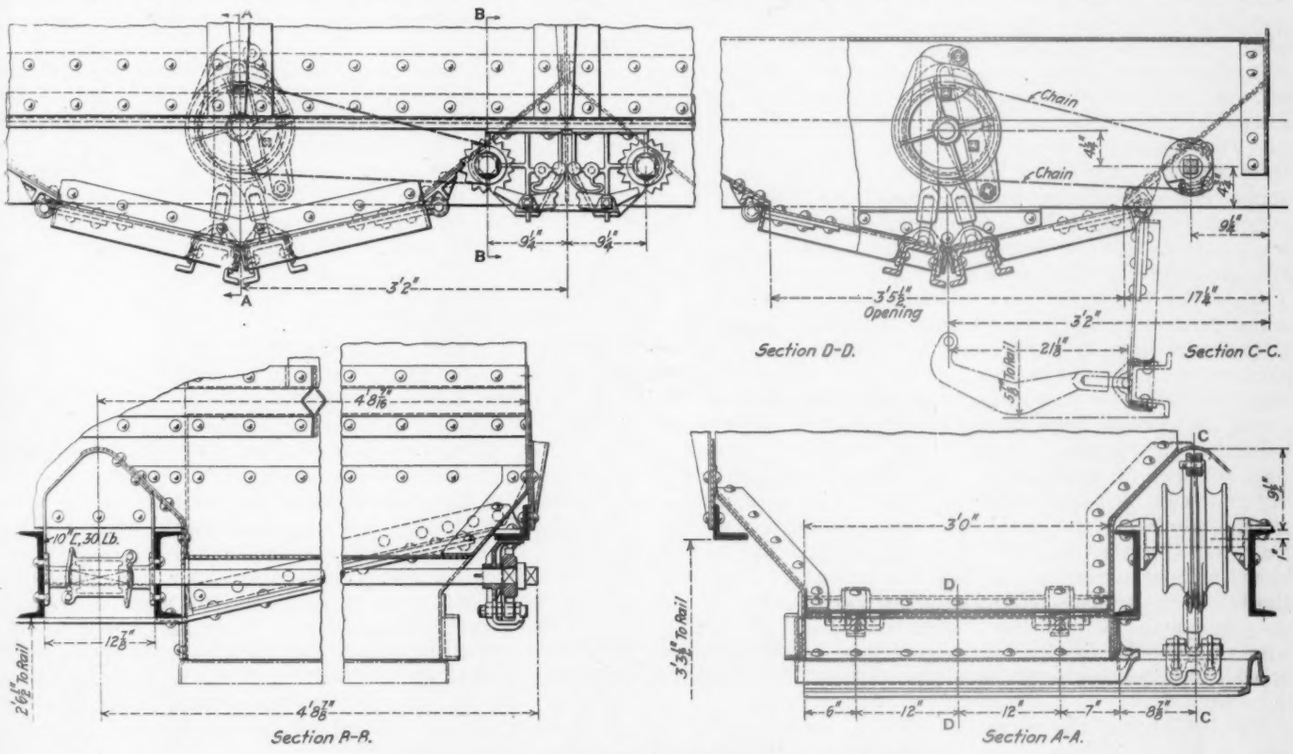
*Door Operating Mechanism.*—The arrangement of the drop doors and the mechanism for operating them, is shown in one of the illustrations. Each door is connected to chain sheaves by two links as shown in section *AA*. The door link is attached to the door channel by an adjustable T-bolt which permits the door being adjusted so it will close tightly. The sheave is located directly above the center line of the door opening, between the center sill channels. These sheaves are operated by a chain which passes over the drum shown in section *BB*, which is operated by the crank from the side of the car. Ratchet wheels and pawls hold the door in any position desired. In the design of the entire arrangement, effort has been made to have it as simple as possible and easily adjusted.

*Trucks.*—The car is carried on two cast steel side frame trucks, having a 5-ft. 10-in. wheelbase, 6½-in. by 12-in. journals, and wrought steel wheels. The side frames are of the box section type in which the brake beam hanger supports, and bolster guides are cast integral. The cast steel journal boxes, secured at either end of the side frame with 1½-in. box bolts, are also tied at the bottom by ⅝-in. by 6-in. journal box tie bars, upon which rest two ½-in. shims which may be transferred to the top of the box, thus providing for 1-in. adjustment in the height of the center plate.

The spring plank is a pressed section ½-in. thick and 16 in. wide at the center, being spread at the ends to 20 in. The spring plank supports the third point suspension spring which is located at the center and extends in either direction along the center line of car a sufficient distance to support the end of the brake beam strut. The bathtub type bolster is composed of a 15/16-in. plate with a ⅜-in. cover plate riveted to the top flanges, supporting the drop forged center plate and side bearings. The bolster is 7 ft. 8 in. long, 17½ in. wide and 14¼ in. deep at the center, tapering to 7¼ in. at either end.

## HANDLING THE INAUGURATION TRAFFIC AT WASHINGTON

Approximately 90,000 people were brought into Washington on March 2, 3, 4 and 5 on account of the inauguration ceremonies on March 5 by the railroads entering Washington, the Baltimore & Ohio, Chesapeake & Ohio, Pennsylvania, Southern and Washington Southern. On account of the weather, the traffic was somewhat less than it was four years ago, but on account of the care exercised in making arrangements in advance and in perfecting the organization at the Union Station of the Washington Terminal Company, the movement was handled without a hitch and without serious congestion or delay. While many incoming trains were late, the fact was ascribed more to weather and other conditions than to the volume of the traffic. Most of the 90,000 people were handled through the Union Station, although a number of special trains of troops and marching clubs that had a considerable amount of impedimenta were handled through the freight yard of the Pennsylvania at Seventeenth street and Pennsylvania avenue, S. E., and the New York avenue freight yard of the Baltimore & Ohio. Approximately 1,200 trains were handled in and out of the terminal station on March 2 to 5 with 640 engines in and 620 engines out. The total number of cars in and out was approximately 8,000. About 275 extra trains were handled in and out of the station. The Pennsylvania handled 44 special trains from all points carrying marching clubs, sol-




**Arrangement of Drop Doors for Pennsylvania Hopper Car**

diers, boy scouts and special parties to and from Washington in addition to the traffic handled on regular trains and the Baltimore & Ohio handled nearly 100 special trains and parties; the Southern had approximately 20 special trains.

The traffic in and out of the Union Station was handled on the 28 station tracks, of which 8 tracks, those used by the Chesapeake & Ohio, the Southern and the Washington Southern, are on the lower level of the station. The special trains and extra traffic on local trains began arriving at Washington on Friday and increased in numbers on Saturday and Sunday. The heaviest day was Monday, the day of the inaugural ceremonies, because a large number of people from nearby points in Maryland and Virginia went to Washington on that day and returned after the ceremonies were over, and also a large percentage of the passengers who had arrived on preceding days left the city on Monday afternoon and evening, but the arrangement of the station is so admirably adapted to the handling of large crowds quickly and the arrangements were so perfect that there was scarcely any congestion even at the time of the heaviest traffic.

The success with which the crowds were handled was attributed by terminal officials not only to the perfection and careful training of the organization in advance, but to a new plan adopted for keeping other than passengers out of the way of incoming passengers in the station. On previous occasions the congestion in the train concourse and station generally has been greatly increased by the number of people who congregate to see the crowds come in or to meet their friends. This year a large board barricade was erected across one end of the waiting room with five openings guarded by special police and no one was admitted to the waiting room or train concourse without a ticket for a train about to leave or without some sufficient reason for admission. This barrier was erected at a sufficient distance inside of the main entrance so that people expecting friends on incoming trains could enter the building and watch for them, but the plan was given general publicity in the newspapers and those expecting friends were advised to make arrangements in advance for meeting them at one of the exits to the station, which were indicated by large letters. Only two entrances were left open by which people could enter the station building and seven doors were used as exits. This arrangement worked admirably and enabled incoming passengers to find their way direct to the exits or to the baggage and parcel rooms without confusion and kept the crowds moving in a steady stream without congestion. The special police at the openings in the barrier were instructed to use judgment in admitting people who had some special reason for entering or who were looking for friends who expected to be met at the train.

The handling of the terminal traffic was under the direction of W. J. Wilson, superintendent of the Washington Terminal Company, and the details had been planned well in advance at conferences with representatives of the tenant lines. The individual roads had also made elaborate preparations for handling the extra traffic with their own organizations well in advance. The supervising force at the terminal was increased in all departments, including additional station-masters, and additional forces in the baggage, police, mechanical and transportation departments, as well as additional ticket sellers. A total of 566 extra men were on duty, including 330 employed for the occasion, the others being experienced men furnished by the tenant lines. Twenty-five extra railroad special police were furnished each by the Baltimore & Ohio, Pennsylvania and Southern. Fifty-six men were added to the station-master's forces, including ticket examiners, ushers and assistant station-masters. Fifty extra telegraph operators were on duty to handle orders in different parts of the terminal and the yards, which are ordinarily handled by messenger service. The baggage and porter service was greatly increased and additional checkers and parcel room facilities were provided. Special checks were used for the parcel rooms of different colors for each parcel room. A large temporary information booth was placed in a central location in the ticket lobby and two smaller information booths were placed in the train concourse under the direction of the Inaugural Committee, which gave information regarding rooms, hotels or points of interest and furnished a free guide service. Large signs were used all over the station to mark exits and to indicate the tracks used by the different roads and to indicate the baggage and parcel rooms. Signs were hung at many places throughout the station to advise people to purchase sleeping or parlor car tickets as far in advance as possible to avoid congestion and a special booth was erected for the extension of tickets.

In order to give all available information regarding the time of arrival of trains a large elevated booth was erected in the center of the train concourse, in which was placed a stereopticon which flashed on a screen frequent bulletins regarding delays in the time of arrival of trains, giving the time they were reported to arrive.

The weather for several days preceding Inauguration Day was rainy and disagreeable enough to reduce the number of people going to Washington, but was not such as to seriously interfere with operation and by Monday afternoon and evening it had cleared up.

Months in advance the operating officers of the different roads had begun making their arrangements for handling the extra traffic and instructing the employees in their duties for the occasion. The Baltimore & Ohio issued a special pamphlet of general instructions, outlining the special arrangements in detail, giving directions where the various employees were to be stationed, etc., and giving instructions for the makeup of trains. These general instructions were to be supplemented by special instructions for the superintendents and other officers. All were enjoined to keep before them constantly that safety is the first consideration and all employees were given instructions about necessary precautions and special inspections to be made to see that all appliances were in proper condition. Extra forces were employed for passenger and station duty and instructed to assist passengers in securing tickets with information as to the arrival and departure of trains. One hundred and thirty engine crews, 70 conductors and 65 brakemen were held in readiness on the Baltimore division and extra locomotives were held at terminals and on side tracks, headed toward Washington until the hour of the inauguration when they were turned in the opposite direction to be ready for the return movement or any emergency. Between March 2 and March 6 Washington yard was cleaned up and all cars moved out, slow freight being discontinued for this period. Thirty special trains were made up ready to leave Baltimore at 6:00 a. m. on March 5 for Washington and local trains were run between Baltimore and Washington during the day at frequent intervals. Instructions were issued that no trains should be made up with more than 10 cars.

The Pennsylvania suspended for March 3, 4, 5 and 6 the operation of all slow freight trains over the Philadelphia, Baltimore & Washington and connecting lines except trains carrying perishable goods. Fifty extra locomotives and train crews were stationed at Philadelphia and Baltimore.

The Southern held a conference of operating officers at Charlotte, N. C., on February 16 to make plans for the handling of equipment and service for the inauguration, which was attended by approximately 200 officers, including two assistant vice-presidents, general manager, the general superintendent of transportation, three general superintendents and other transportation and mechanical department officials. At this meeting the principal plans were outlined in detail and thoroughly understood and supplemental or revised instructions were issued from time to time afterward. Twenty extra Pullman cars were held available at Washington for handling return business on regular trains from March 5 to 8 and 15 extra coaches were held available.

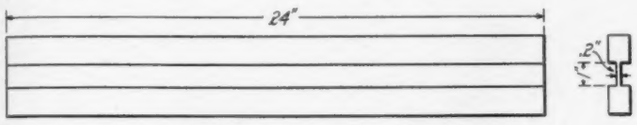
# A Two-Section Plate Fulcrum Track Scale

**An Innovation in Weighing Mechanisms Has Been Installed on the Pennsylvania Railroad at Pitcairn, Pa.**

By J. H. A. Bousfield
Chief Engineer, E. & T. Fairbanks & Co., St. Johnsbury, Vt.

THE Pennsylvania Railroad, one of the pioneers in the use of plate fulcrum track scales, recently installed the first two-section track scale of this type at Pitcairn, Pa. This form of construction eliminates the knife edges which have been of practically universal application in scales of all kinds. In consequence of this change the need for regrinding and renewing knife edges and bearings is done away with. Similarly dead rails or their equivalent in the form of relieving gears are eliminated.

As indicated by the name, a thin plate continuous from lever to bearing takes the place of the knife edge. These plate fulcrums consist of relatively thin central portions connecting two heavier portions or heads. The thin portion




**Details of a Plate Fulcrum**

gives the desired flexibility while the large heads distribute the load on the supporting members and decrease the unit stresses. The thin central portions are all arranged to act in direct compression, but are subjected to a slight flexure as the weighing beams vibrate and the lever system responds to the condition of balance. Thus the necessary vibration is taken care of without need of any wear such as takes place with a knife edge scale and the thin plates of steel remain in their original condition regardless of the amount of weighing that is done by the scale.

### General Construction

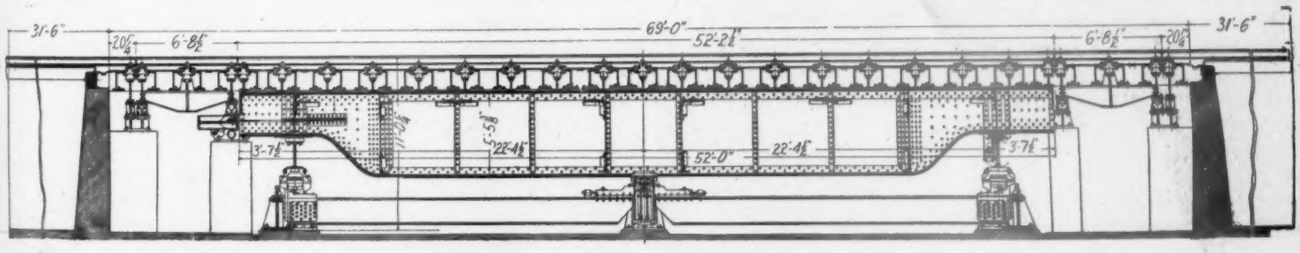
The general layout of the scale is shown in the drawing. The scale is installed in a concrete pit and the foundation piers and walls are reinforced with twisted bars. The inside length of the pit is 69 ft., the inside width is 10 ft. and the height from top of foundation piers to base of rail is 10 ft. 6 in. The effective length of the weighing rail is 52 ft., the additional length of pit being used to provide approach spans supporting a short section of rail which is independent from both the main track and the weighing rail. The latter is supported on cast iron rail stands which rest upon steel cross ties supported on the main girders.

A rigid deck type of construction is used. The deck is composed of 5/16-in. steel plates supported on 12-in. channels which rest on bearing plates supported by a ledge in the side walls of the pit. These channels are curved to give a crowning effect to the deck, which will shed the surface water effectively. The steel plate is covered with ¾-in. cork brick.

The scale is of the two-section type wherein four main levers transmit the load to two longitudinal extension levers which in turn transmit to a transverse extension lever and this lever is connected directly to the weighing beam. The main and longitudinal extension lever stands are supported directly on base castings which rest on the concrete foundation. Only seven levers are used in the scale, thus making a simple and effective construction, entirely eliminating the complication of intermediate sections encountered when the four-section type of scale is used. The main girders are so designed that a test car may be placed directly over the center line of a section. This has never been practical with track scales built in more than two sections. An effective means is thus provided for accurate calibration, and as there are only two sections in the scale the final adjustment in the field is simple.

The main bridge is constructed of two plate girders, one on each side of the scale. These are 5 ft. 2 in. deep, back to back of angles, and reduce to 2 ft. 7 in., where they are supported on the scale sections. The girders are tied together by means of transverse and diagonal bracing so that a rigid bridge construction is produced. The steel cross ties are composed of 10-in. 35 lb. I-beams securely riveted to the top flange of the girders. The rail stands are supported directly on the cross ties.

The approach spans are composed of 18-in. 70-lb. I-beams which are supported on base plates provided with spool bearings which insure alinement of the approach rails with the weighing rail without any distortion or springing of the rails. The 18-in. I-beams in turn support a steel casting which furnishes a support for an intermediate rail stand under the approach rails. These rails are 6 ft. 8 in. long and are independent of the weighing rail and also of the rails in the main track.




**Longitudinal Section of the Complete Scale**

The rail stands are designed to shed the surface water. This is accomplished by two umbrella flanges, one above the deck and the other below. The top flange will shed the most of the surface water away from the opening in the steel deck. The lower flange in turn sheds the small amount of water which may pass through into a water trough under the deck and a system of spouting is arranged to convey the water to a sump in the bottom of the pit.

### The Lever System

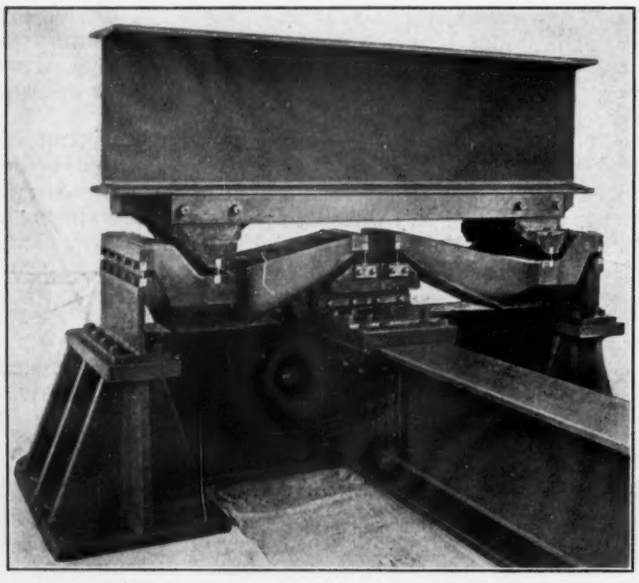
The four main levers are made of steel castings and each lever is arranged to support three plate fulcrums. For the

reception of the load plate, a rectangular recess is provided in the lever of sufficient width to accommodate both the head of the plate fulcrum and a clamping block. One side of the head is vertical and engages with the vertical side of the recess. The other side is tapered and engages with a corresponding taper on one edge of the clamping block. The opposite edge of the clamping block is vertical and engages with the other vertical edge of the recess. The clamping block is forced down into position by means of cap screws. This action forces the plate fulcrum head firmly against the side of the recess and retains it in a fixed position. The seats for the plate fulcrums are accurately machined to maintain the true theoretical distance between the center lines of the plates and also to preserve their exact parallelism.

The longitudinal extension levers are composed of 20-in. 140-lb. Bethlehem girder beams to which steel castings are attached at the butt ends to carry the plate fulcrums. Steel casting connection angles at each side of the webs of the girders connect the castings carrying the plate fulcrums to the I-beams by means of tapered belts made a driving fit into reamed, tapered holes. The plate fulcrums are supported in square machined seats and are held in position in the same way as the end plates in the main levers.

The nose irons are steel castings provided with machined seats for the heads of the plate fulcrums. They are held in position on the levers by 1¼-in. studs. Adjustment of the nose irons is furnished by means of non-corrosive adjusting screws.

The transverse extension lever is composed of a 10-in. 105.5-lb. Bethlehem H-beam and is furnished at the butt end with a steel casting for the support of the plate fulcrums. The nose iron is of cast iron and the plate fulcrum



**Main Levers and Longitudinal Extension Lever at the Fixed End of the Scale**

is held in position in the same way as in the nose irons for the longitudinal extension levers. It is held in position by 1-in. studs and adjustment is provided by means of a non-corrosive adjusting screw.

The multiplication of the levers is as follows:

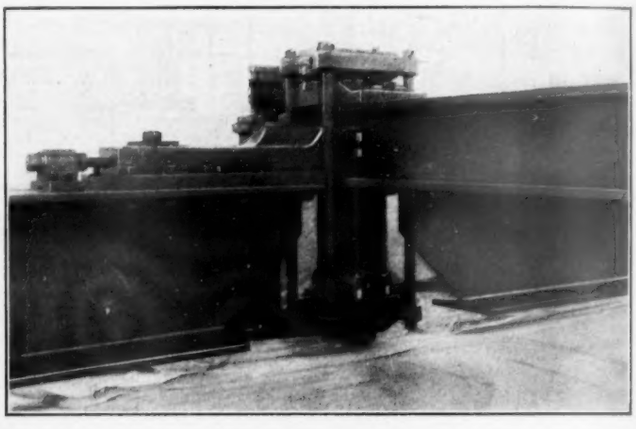
| | | |
|---|---|---|
| Main levers | Multiple | 3½ |
| Longitudinal extension levers | " | 20 |
| Transverse extension lever | " | 11 3/7 |
| Butt of weighing beam | " | 800 |

The lever stands are steel castings having a single web connected to a heavy lower flange. They are machined for the support of the plate fulcrums, the seats being made in the same way as the end seats in the main levers. In the plate fulcrum construction, it is necessary that one of the plate fulcrum heads be attached to the lever and the other to the lever stand or to the block transmitting the load so that is was necessary to provide accurately machined seats for them.

The base plates for the lever stands were machined on both the top and bottom surfaces. The piers supporting them were hammer dressed and rubbed down and in order to overcome any slight inequalities a ¼-in. thickness of "linotyle" was used between the concrete foundation and the base plates.

### Connections

The connections between the tips of the main levers and the longitudinal extension levers are made by means of steel castings in which recesses were provided at right angles to each other for engagement with the heads of the plate fulcrums in the main levers and longitudinal extensions. The



**Junction of the Longitudinal Extension Levers with the Transverse Extension Lever**

recesses in these castings are accurately machined to preclude initial stresses in the plate fulcrums and to insure that the main levers and longitudinal extensions would be exactly at right angles to each other.

The longitudinal extension levers are connected to the transverse extension lever by means of radial struts which are furnished with hardened curved steel surfaces in the lower portion which engage with hardened steel bearing plates supported on a platen which in turn is suspended by rods from the bearing block engaging with the load plate in the transverse extension lever.

The bearing plates are encased by housings which are designed so that they can be adjusted in the longitudinal direction and they are operated by means of non-corrosive adjusting screws. This is necessary so as to enable the radial struts to be maintained in a vertical position, should there be any adjustment of the longitudinal extension lever nose irons.

### Bridge Supports

Steel castings provided with machined slots for the reception of the intermediate or load plate fulcrums in the main levers, furnish a means for the transmission of the load to the lever system. The castings are tied together in the transverse direction by means of tie bars held in position by ⅞-in. dowel pins.

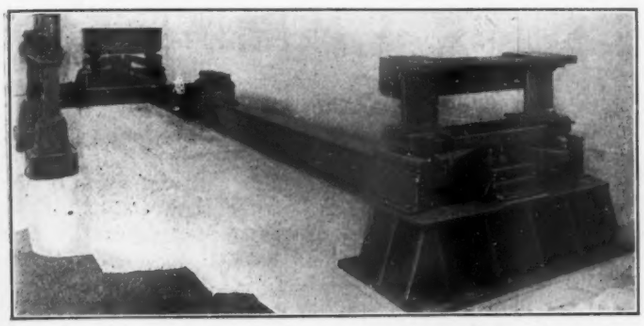
The main bridge is fixed at one end and free to move at the other. The fixed end is supported by means of a transverse I-beam engaging directly with the bearing castings. The movable end of the bridge is supported on cast steel struts provided with hardened steel inserts, ground to a radius, and engaging with hardened steel plates at their top and bottom surfaces. The lower plates are directly supported

on two steel castings similar to those described for the transmission of the load at the fixed end.

Housings are provided for the steel bearing plates and adjustment is provided in the longitudinal direction by a non-corrosive adjusting screw so that the struts may be placed in a truly vertical position when the bridge is in its normal longitudinal position. Recesses are provided at the top and bottom bearing plates in which oiled felt is inserted to prevent rusting of the rocker or the housing.

### Special Features

The main bridge is checked in the longitudinal direction by means of a stray plate 44-in. by 1-in., reduced to ¼ in. at each end to allow for flexure. This stay plate is secured to the girders by means of a heavy transverse connection



**The Scale Assembled Without the Girders or Floor**

and is anchored to a cast steel transverse support which in turn is securely anchored to the foundation. The transverse checking is arranged with a connection to the transverse support at the movable end of the bridge and is connected to a rigid support attached to the side walls of the pit. These transverse checks are composed of 2 rods 2⅛ in. in diameter, reduced to 1½ in. in diameter at each end to provide for flexure.

The expansion of the main bridge is provided for by means of the rocker struts heretofore referred to in connection with the support at the movable end of the bridge. The expansion of the longitudinal extension levers is afforded by the struts forming a part of the connection of the longitudinal extension levers to the transverse extension lever. The change in length of the transverse extension lever is provided for by means of the strut engaging with the platen, supported by means of the suspension rods from the butt end of the beam.

### The Weighing Beam

The weighing beam is of open hearth steel machined all over and supported by means of plate fulcrums. It is provided with an indicator which moves over a graduated scale and thus furnishes a means for taking a very exact balance. A locking device is provided so that the beam can be securely locked when the scale is not in operation. This consists of an eccentric which engages with a flat spring so that a pressure of 150 lb. is applied at the permanent beam stop.

A stabilizing weight is located exactly over the fulcrum and is provided with vertical adjustment so that the period of vibration of the beam can be changed at will to suit local weighing conditions.

Immediately over the indicator fulcrum, a small vertical weight is applied which is provided with screw adjustment in the vertical plane with which the sensibility can be adjusted.

An oil dash pot is provided at the tip end of the beam to steady its motion.

The main beam is graduated to 300,000 lb. by 1,000-lb. notches and the fractional bar to 1,000 lb. by 50-lb. notches. An auxiliary weight of 100,000 lb. equivalent is furnished so that it can be applied at the tip of the beam to give a total weighing capacity of 400,000 lb. The poise is fitted with ball bearings and a center indication is provided for. The faces of the main beam and the fractional bar are made of "monel" metal and the figures and graduations are filled with red.

The scale pit is heated by means of a hot water system, sufficient radiation being provided to maintain a temperature of 60 deg. F. in the pit.

Electric lights are installed to illuminate the pit for proper inspection of all parts of the mechanism.

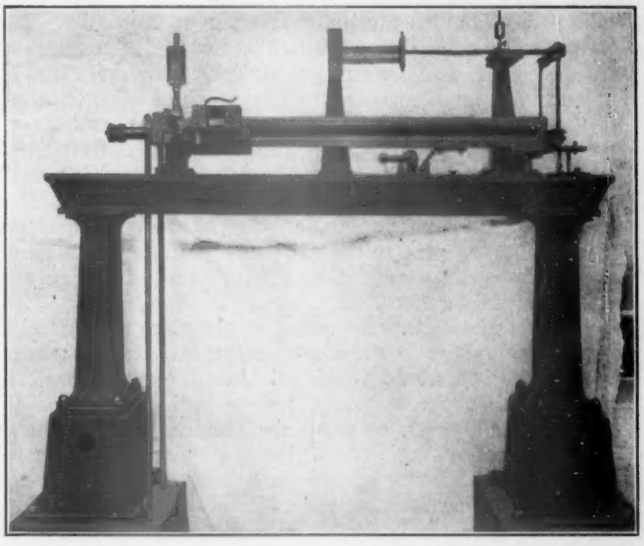
### Design Data

The plate fulcrums in the main and extension levers are composed of high grade chrome vanadium alloy steel with an ultimate tensile strength of 200,000 lb. per sq. in. They are machined to dimensions and accurately fitted in the levers. The plate fulcrums in the weighing beam are made of high grade "blue strip" steel. All the plate fulcrums are designed so that the stresses induced by flexure are well within the elastic limit.

In designing the scale a theoretical load of 400,000 lb. was considered as being concentrated on each section. With this loading, the following stress limits expressed in lb. per sq. in. are not exceeded.

| Nature of Stress | Cast Iron | Cast Steel | Wrought Iron | Structural Steel |
|---|---|---|---|---|
| Tension | 2,500 | 8,000 | 8,000 | 10,000 |
| Compression | 5,000 | 8,000 | 8,000 | 10,000 |
| Shear | 2,500 | 6,000 | ..... | 7,000 |
| Torsion | 2,500 | 6,000 | ..... | 7,000 |

After the installation had been completed, the scale was tested under varying increments of load from 25,000 lb. to



**The Weigh Beam**

140,000 lb., both concentrated and distributed, and there was no perceptible error. Practically a "straight line" calibration was obtained, that is, the scale gave accurate results with loads varying from 25,000 lb. to 140,000 lb. These results were due to the plate fulcrum construction and the two-section principle together with the absence of material deflections of any of the parts.

The scale was built by E. & T. Fairbanks & Co., St. Johnsbury, Vt., and its development has been due to collaboration between E. & T. Fairbanks & Co., the Pennsylvania Railroad, and A. H. Emery. The design is patented. The plate fulcrum principle has been used by Mr. Emery in large testing machines for many years. The plate fulcrum type of scale has been adopted as standard by the Pennsylvania

Railroad for track scale construction and it is expected that more installations will be made in the near future.

The plate fulcrum track scale is being placed upon the market by The Fairbanks Company and Fairbanks, Morse & Co., Chicago.

## RECIPROCAL DEMURRAGE—"IMPROVED"

The following statement by J. A. Switzer, professor of hydraulic and sanitary engineering at the University of Tennessee, outlining a suggested plan for promoting car efficiency by compensating shippers and consignees for releasing cars promptly, was put into the Congressional Record of February 27, by Representative Austin of Tennessee:

It is within the province of Congress by means of an amendment to the interstate-commerce law to alleviate, if not to entirely relieve, the present car shortage from which the business interests of the country are suffering, and to largely prevent a recurrence of the trouble. This amendment would act to revise the present demurrage practice of the railroads in such a manner as to raise the efficiency of use of existing rolling stock, thereby permitting the same to meet the country's requirements.

The present demurrage practice is an unscientific effort to secure for the railroads the co-operation of the shipping public in the use of freight cars. It is one that does not appeal to the shipping public and does not bring out the measure of co-operation which by a revision of the practice could easily be secured.

The present practice acts as a penalty clause in the contract between the railroad and the railroad's customer. There is no balancing bonus clause. In engineering contracts the courts have held that a penalty clause is not valid unless the contract contains a counterbalancing bonus clause. The equity of this principle of law has received feeble recognition in connection with demurrage practice, for the railroads offer to their larger patrons the advantage of what is known as the average demurrage agreement; but the average demurrage agreement is not truly reciprocal. A concern which habitually releases cars within a time less than the stipulated 48-hour period receives no advantage, nor any form of compensation in return; and the present practice, therefore, offers no inducement to the railroads' patrons to co-operate with them in securing the maximum possible efficiency of use of the rolling stock. . . .

The amendment here suggested would place the control of demurrage practice in the hands of the Interstate Commerce Commission; it would make all demurrage reciprocal by requiring that the railroads pay a cash bonus for the early return of cars, to offset the fine for their detention, and would be so administered that at the end of each month the demurrage account of each patron of the railroad would be closed by a cash transaction in favor of the railroad if car detentions overbalanced early releases, or in favor of the patron if the reverse.

Further, the amendment would authorize the commission to adopt a sliding scale of demurrage and require the commission to readjust and publish the demurrage rates either quarterly or at semi-annual intervals in accordance with the real cash value of the use of cars. This latter provision is of utmost importance. The cash value of the use of cars varies over a wide range, according to the times. When business is at flood, as at the present time, the return of cars has a high cash value, whereas during periods of business depression the car supply exceeds the requirements, and the prompt release of cars loses all, or nearly all, cash value. At such times the amount of demurrage (both on the bonus and the penalty side) would naturally be fixed at a low figure.

The Interstate Commerce Commission should find no difficulty in arriving at a just value for demurrage for any ensuing three-months' or every six-months' period, and any error of judgment in fixing the value would be insignificant.

The revision of demurrage practice here outlined would apply to one branch of railroad management an elementary principle of efficiency management to which at present it is a stranger. The present efficiency of use of freight cars is astonishingly low. An increase in the efficiency of use of existing cars of only about 2½ per cent would suffice to relieve the acute car shortage. The proposed revision would immensely benefit the railroads, in that it would reduce the ratio of capital investment in rolling stock to the return upon such investment, and it would secure for the railroads a larger measure of co-operation from the shipping public in the economical use of cars.

## HEARING ON SAFETY APPLIANCES

The Interstate Commerce Commission held a hearing at Washington on March 1 on the application of the railroads for a further extension of time of one year from July 1, 1917, within which to complete the equipment of their cars with safety appliances in accordance with the order of the commission of March, 1911, and the law of 1910. The commission had allowed the railroads five years within which to equip their cars and later granted another extension of one year until July 1, 1916.

A. W. Thompson, vice-president of the Baltimore & Ohio, appeared on behalf of the executive committee of the American Railway Association and told the commission that on January 1, 1917, out of 2,519,832 cars 296,033, or 11.7 per cent, were not completely equipped to comply with the law. Mr. Thompson said that the abnormal amount of traffic handled by the railways during the past year has greatly increased the difficulty of equipping the cars, because the mechanical forces have been busy in keeping up the necessary running repairs; the cars have been scattered away from home to an unusual extent, making it difficult to get them to repair points on home roads; it has been difficult to obtain sufficient good labor and the cost of labor has been increased even beyond the increase in wages. Also, he said, the efficiency of labor has decreased from 25 to 50 per cent. Mr. Thompson said that the cars not completely equipped all have the principal safety appliances such as automatic couplers, power brakes, etc., and that on many of them the only work required is changing grab irons, hand holds, steps and ladders, and in some cases grab irons must be changed in order to secure an increase of an inch to an inch and a half in length and many cars must be equipped with new draft gear to secure greater clearance between cars. A great many cars are now being operated that under other conditions would have been dismantled. The Baltimore & Ohio formerly would put out of service a car requiring over $450 worth of repairs, but cars are now being kept in service requiring expenditures up to $650 because the cost of cars has doubled in two and one half years and delivery cannot be secured without long delay. The company recently took bids on 1,000 coal cars and found it could not get delivery inside of 22 months. Many roads have been handicapped by difficulty in securing materials while others that have the materials on hand for equipping the cars have not done so because of the great demand for the cars in service.

Unless the extension of time is granted, Mr. Thompson said, it will be necessary to take out of service approximately 296,000 cars, which under present conditions would be nothing short of a calamity. The greatest number of cars equipped in accordance with the order in a six months period has been 187,000. During the last six months of 1916 only 160,000 cars were equipped and at this rate it would take another year. Commissioner Clements asked why the railroads had not taken advantage of the opportunity to

equip their cars two years ago when cars were standing idle and the railroads were reducing their forces. Mr. Thompson replied that many railroads did not have the money to do the work at that time or felt that they could not afford to repair the cars with a prospect of having them stand idle so long that they would have to be overhauled again before they could be put into service. It would have been a fine thing, he said, if the railroads could have taken advantage of the opportunity at that time, not only to repair cars, but to purchase cars for future use when the prices were low. Commissioner Clements asked what assurance the commission would have that the work would be completed if the extension were granted. Mr. Thompson said that the only definite assurance would be to ask the railroad executives to sign a contract as they did in the case of the car service rules.

Guy M. Freer, president of the National Industrial Traffic League, told the commission that unless there was a very sudden decrease in business the withdrawal of a large number of cars from service would be a great calamity to the shipping public and he thought that if it could be consistently done the shippers would like to have the time extended.

C. E. Chambers, superintendent of motive power of the Central of New Jersey, and President of the Master Car Builders' Association, also urged the extension of time. He said his road had mapped out a plan by which it expected to have all its cars fully equipped by January 1, but the demand for the cars in service was so great that beginning with September 1 it was necessary to fall behind the program. He thought it would take an average of three days' work per car to equip the cars on his road, because it would be necessary to remove appliances already installed to make slight changes. For a time his company was equipping 700 cars a month, but in January the number had been reduced to 298.

C. W. Van Buren, chief master car builder of the Canadian Pacific, and James Coleman, superintendent of the car department of the Grand Trunk, said that the Canadian roads would need three years more to completely equip their cars because thousands of them were scattered throughout the United States so that it would be difficult to get them home and the difficulty of securing labor in Canada was very great because so many men have gone into the army. Mr. Coleman said the Grand Trunk was employing women in its shops and for many kinds of work formerly performed by men and that all of the large railway shops are engaged in ammunition work by order of the government. Mr. Coleman said that when the Interstate Commerce Commission order was issued the Grand Trunk had just completed putting four ladders on each car in compliance with the Canadian law, but had to take them off and put them on again to comply with the different specifications of the commission's order.

W. E. McEwen, representing a number of tank car lines, told of the difficulty in getting tank cars equipped in the railroad shops, which made it necessary to do the work in the shops of the larger tank lines and it took a long time to get them home.

The various witnesses were cross-examined at length by W. G. Lee, president of the Brotherhood of Railroad Trainmen, W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and L. E. Sheppard, acting president of the Order of Railway Conductors, who strongly opposed the idea of any extension in time and insisted that many of the cars could be equipped without difficulty and without taking them into the shops.

H. W. Belnap, chief of the Division of Safety, testified at the request of the commission. He said he had repeatedly called attention in his annual reports to the need of special diligence on the part of the railroads in getting their cars equipped, but that they had been slow about getting started with the work. He said that during the first six months only 37,000 cars were equipped. In each succeeding six months the number had increased until recently; if the railroads had done as well during the first years as during the last three years, he said, the work would now be completed. He thought that if the railroads had to do it they would succeed in getting a large percentage of their cars equipped, but that it would be necessary first to issue orders that no cars would be received from owning lines until properly equipped and later to issue another order that no car would be received in interchange until properly equipped and that some plan should be worked out by which the work could be done by foreign lines without returning the car home for repairs. He saw no reason why it was necessary for the roads to have this work done at their own shops, saying it could be done just as well in other shops and billed against the owning road, but that some roads had refused to equip cars with safety appliances for other roads. He thought that some roads had not been diligent in equipping their cars and that many could bring a large percentage of their cars into compliance with the order within 30 days by making only slight changes and by installing couplers with extended heads to give the required clearance. Reports made by his inspectors showed, Mr. Belnap said, that the roads had not been properly diligent in equipping even the company service cars that do not go onto other lines.

At the conclusion of the hearing W. G. Lee entered a protest on behalf of the four train service brotherhoods against any extension of time under any consideration. He said that some roads which at the last hearing said they did not need an extension of time, but were asking it only for the benefit of other roads, had taken advantage of the extension and had not even yet completed the equipment of their cars.

## TRAIN ACCIDENTS IN JANUARY[1]

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of January, 1917:

*Collisions*

| Date | Road | Place | Kind of Accident | Kind of train | Kil'd | Inj'd |
|---|---|---|---|---|---|---|
| 3. | Baltimore & Ohio | Sand Patch. | bc | F. & F. | 0 | 3 |
| 9. | Georgia S. & F. | Adel. | rc | P. & F. | 0 | 1 |
| *14. | Fort Worth & D. C. | Ft. Worth. | bc | F. & F. | 1 | 1 |
| *17. | Northern Pacific | Marshall. | rc | F. & F. | 3 | 0 |
| 19. | Boston & Alb. | Framingham. | rc | P. & P. | 0 | 3 |
| 26. | N. Y. N. H. & H. | Cheshire. | bc | F. & F. | 1 | 2 |
| †27. | Chicago, R. I. & P. | Mounds, Ark. | rc | P. & P. | 3 | 20 |
| 28. | N. Y. N. H. & H. | Waterbury. | xc | P. & F. | 0 | 49 |

*Derailments*

| Date | Road | Place | Cause of Derailment | Kind of train | Kil'd | Inj'd |
|---|---|---|---|---|---|---|
| 2. | St. Louis I. M. & S. | Argenta | malice | P. | 1 | 2 |
| 7. | Seaboard | Schofield. | ms | P. | 1 | 2 |
| 13. | Georgia S. & F. | Chula, Ga. | d. switch | P. | 0 | 2 |
| 16. | Pennsylvania | Switz City. | neg. | F. | 1 | 1 |
| 16. | Ches. & Ohio. | Spencer, Ky. | b. rail | P. | 0 | 10 |
| 18. | N. Y. Central | Pembroke. | snow | P. | 1 | 0 |
| 24. | Pennsylvania | Oil City. | d. switch | P. | 0 | 9 |
| 25. | Georgia & Florida. | Douglas, Ga. | d. track | P. | 0 | 8 |
| 28. | Pennsylvania | Landisville. | b. axle | P. | 0 | 28 |
| 30. | Chicago M. & St. P. | Roscoe. | b. rail | P. | 0 | 15 |
| 31. | Wabash | Dillon. | b. rail | P. | 2 | 2 |

*Other Accidents*

| Date | Road | Place | Cause of Accident | Kind of train | Kil'd | Inj'd |
|---|---|---|---|---|---|---|
| 6. | Southern | Birmingham. | explosion | P. | 2 | 4 |
| 12. | St. Louis-S. F. | Grandview. | boiler | F. | 3 | 0 |

The trains in collision near Sand Patch, Pa., on the 3rd were westbound and eastbound freights. Both locomotives and six cars were damaged. Three trainmen who jumped off just before the collision were injured.

The trains in collision near Adel, Ga., on the night of

[1] Abbreviations and marks used in Accident List: rc, Rear collision——bc, Butting collision——xc, Other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction——unx, Unexplained——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc. ——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

the 9th were northbound passenger No. 4 and a preceding freight which was entering a side track. The engine of the passenger train was overturned, and the fireman, who jumped off, was injured. There was a dense fog at the time. Responsibility for the collision is charged against the flagman of the freight.

The trains in collision near Fort Worth, Tex., on the night of the 14th were a freight train, No. 19, moving backward, and a switching freight, also moving backward. Two freight cars were thrown off the track and a caboose was wrecked. The conductor of the freight was crushed to death beneath the caboose and a man (in charge of freight) riding in the caboose, was seriously burned. There was a driving snowstorm at the time, and it is said that the lights in the caboose of the freight train were obliterated by the snow.

The trains in collision at Marshall, Wash., on the 17th were westbound freights; extra No. 1545, consisting of a locomotive and a caboose, ran into the rear of a preceding freight. The caboose and four cars of the leading train were wrecked and the caboose was destroyed by fire. The conductor and two brakemen of this train were killed. Extra No. 1545 had run past an automatic block signal set against it.

The trains in collision at Framingham, Mass., on the 19th were eastbound passenger trains, an express running into the rear of a local passenger train just starting from the station. The baggage car at the rear of the leading train was wrecked. Three passengers were slightly injured. The cause of the collision was the failure of the air brakes. They had been tested at Worcester, 23 miles back, but the self locking angle cock on the tender was found closed. The engineman had not made the running test required by the rule.

The trains in collision at Cheshire, Conn., on the 26th were a southbound freight drawn by one engine and a northbound freight drawn by two. One fireman who jumped off was killed, and two other trainmen were injured. The southbound train had run a short distance past the switch where it should have met the northbound; the engineman evidently having miscalculated the distance in which the air brakes could be made to stop the train.

The trains in collision on the Chicago, Rock Island & Pacific at Mounds, Ark., on the night of the 27th were eastbound passenger No. 604, and a following eastbound passenger of the St. Louis Southwestern. The two rear cars of the Rock Island train were badly damaged. Three passengers were killed and 20 injured. There was a dense fog at the time.

The trains in collision near Waterbury, Conn., on the evening of the 28th were a westbound express passenger, and a locomotive without train and unattended, which struck the rear car of the passenger at a crossover, and overturned it. Forty-nine passengers claimed to have been injured. The light engine had been deserted by the fireman, who was in charge of it making a yard movement, because of the belief on his part, which, however, was unfounded, that his engine was about to collide with another train.

The train derailed at Argenta, Ark., on the 2nd was southbound passenger No. 3. The engine and first three cars were ditched. A trespasser was killed, and the engineman and fireman were injured. The derailment was due to a maliciously misplaced switch.

The train derailed at Schofield, S. C., on the 7th was southbound passenger No. 7, the "Flamingo Special." The engine and first two cars were derailed at a misplaced switch. The engineman was fatally injured, and two other trainmen were less severely hurt.

The train derailed at Chula, Ga., on the 13th was southbound passenger No. 33. One passenger car was ditched and a freight car standing on a side track was damaged. Two passengers were injured. The train was running about 40 miles an hour and the derailment occurred at a loose switch.

The train derailed at Switz City, Ind., on the 16th, at 2:20 a.m., was westbound freight No. 73. The engine was overturned and the engineman was killed. The fireman was injured. The derailment occurred at the derail approaching the Illinois Central Crossing and the train had passed signals set against it. The engineman had been on duty about six hours after being off nine hours.

The train derailed near Spencer, Ky., on the 16th was a southbound mixed train. The coach broke through a trestle, and seven passengers and three trainmen were injured. The cause of the derailment was a broken rail.

The train derailed on the New York Central at Pembroke, N. Y., on the 18th was a westbound passenger. The engine was overturned in a hard snowbank about 3 ft. deep, and the engineman was fatally injured.

The train derailed on the Pennsylvania near Oil City, Pa., on the 24th was a southbound passenger. Six passengers were injured. Two trainmen and a track laborer who was standing near the line also were injured. The cause of the derailment was a broken switch-stand connection.

The train derailed on the Georgia & Florida, near Douglas, Ga., on the 25th was a southbound passenger. One coach was overturned. Eight passengers were injured. It is believed that the derailment was due to a soft spot in the roadbed, caused by heavy rain.

The train derailed near Landisville, Pa., on the night of the 28th was eastbound express No. 570. Three coaches ran off the track. Eighteen passengers and ten dining car employees were injured. The cause of the derailment was a broken axle in the front tender truck.

The train derailed near Roscoe, S. D., on the 30th was westbound express No. 15. Three cars were ditched. Ten passengers and three trainmen were injured. The cause was a broken rail.

The train derailed near Dillon, Ind., on the 31st was an eastbound express passenger. The engine was overturned and the engineman and fireman were killed, and two passengers were injured. The cause of the derailment was a broken rail.

The train involved in the accident near Birmingham, Ala., on the 6th was a westbound express. One end of a car was wrecked by an explosion of nitro-glycerine in the washroom. Two passengers were killed and four were injured. It is believed that the explosion was caused by one of the victims, whose purpose was to kill himself.

The train involved in the accident near Grandview, Mo., on the 12th was a southbound freight, ascending a steep grade. The boiler of the locomotive exploded and was thrown off the frame and into the ditch. The engineman, fireman and one brakeman were killed.

*Electric Car Accidents.*—Of the half dozen serious electric car accidents reported in the papers in January three were attended with fatal results. In a butting collision on the Jamestown, Westfield & North Western, near Mayville, N. Y., on the 1st, the two motormen were killed and 24 passengers were injured. Each train consisted of a single heavy steel car and both were running at full speed. At Rockford, Ill., on the 12th, a street car was struck by a passenger train of the Illinois Central at a crossing and the street car was thrown into a creek; three of its passengers were killed and six were injured. In a butting collision on the Cleveland, Southwestern & Columbus, near Strongville, Ohio, on the 27th, between a freight train and a passenger train, four passengers were killed and nineteen were injured. The men in charge of the freight train had run past the side track where they should have waited to meet the passenger.

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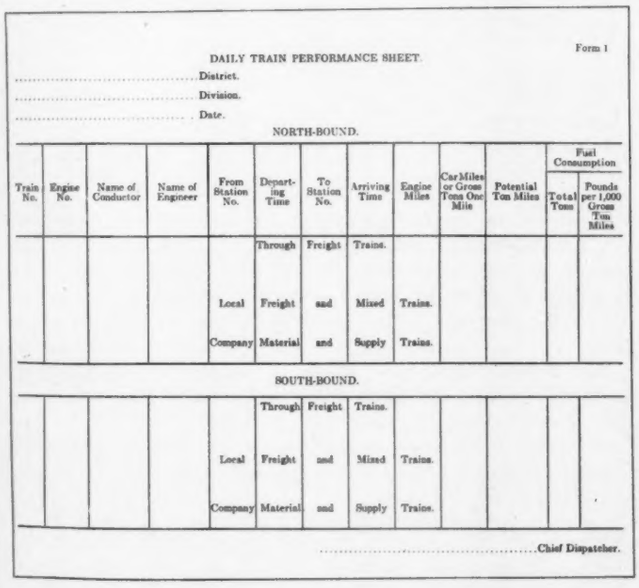
NEW BRITISH DEFENSE REGULATION—A new regulation under the Defense of the Realm Act has, by an Order in Council, been made which forbids trespassing on any railway or loitering on, under, or near any tunnel, bridges, viaduct or culvert.—*The Engineer, London.*

# Transportation Expenses on the Katy

## Analysis Made of the Reasons for the Comparatively Small Trainload and Suggestions for Obtaining Better Results

A VERY brief summary of the report made by J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe, on the Missouri, Kansas & Texas was published in the *Railway Age Gazette* last week. The following is a summary of the chapter in that report on "Transportation."

The principal competitors of the Missouri, Kansas & Texas on merchandise traffic are the St. Louis, Iron Mountain & Southern, the Texas & Pacific, the St. Louis Southwestern, the St. Louis & San Francisco, the Atchison, Topeka & Santa Fe and the Chicago, Rock Island & Pacific. The schedules of the Katy are practically the same from St. Louis to Ft. Worth, Tex., and Dallas as the Cotton Belt-Iron Mountain route, and about the same as the Cotton Belt to Waco, Tex. The Cotton Belt is the strongest competitor of the Katy to Texas points and conferences have been held looking to the lengthening of merchandise freight schedules, but without result, because the Katy, which is the short line from Kansas City, maintains much faster schedules from Kansas City to Ft. Worth, etc., and cannot therefore induce the other roads to reduce their schedule from St. Louis. The Cotton Belt and Iron Mountain make one day quicker time from St. Louis to Galveston than the Katy, but the much greater mileage of the Katy does not justfy it in meeting



Form 1

DAILY TRAIN PERFORMANCE SHEET.

.....District.

.....Division.

.....Date.

NORTH-BOUND.

| Train No. | Engine No. | Name of Conductor | Name of Engineer | From Station No. | Departing Time | To Station No. | Arriving Time | Engine Miles | Car Miles or Gross Tons One Mile | Potential Ton Miles | Fuel Consumption: Total Tons | Fuel Consumption: Pounds per 1,000 Gross Ton Miles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Local Company | Through Freight and Material | Freight and Supply | Trains. Mixed Trains. | Trains. | | | | |

SOUTH-BOUND.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Local Company | Through Freight and Material | Freight and Supply | Trains. Mixed Trains. | Trains. | | | | |

.....Chief Dispatcher.

this competition. The Katy between St. Louis and Waco has an average speed for merchandise trains of 15.1 miles per hour and the train reaches Waco at 5:45 a. m. on the third day, while the Iron Mountain-Texas & Pacific route does not deliver St. Louis freight at Waco until 8 p. m. of the third day, and the Cotton Belt at 1:20 p. m. the third day. Thus the Texas & Pacific delivery is in reality fourth day delivery, and if the Cotton Belt train is late its delivery is also fourth day delivery. The Iron Mountain-Texas & Pacific route is 13 miles shorter than the Katy, and the Cotton Belt route 44 miles shorter.

Between St. Louis and Dallas the Katy averages 14.2 miles per hour and makes third morning delivery, as do all the other roads, except the Frisco, which, although 48 miles shorter than the Katy, makes delivery on the afternoon of the third day, and when the train is not on time this means fourth day delivery.

Between St. Louis and Ft. Worth the Katy averages 15 miles and makes delivery on the morning of the third day, as do all the other roads except the Frisco, which makes delivery at 1 p. m. on the third day. The Frisco route between St. Louis and Ft. Worth is 23 miles shorter than the Katy. Between Kansas City and Ft. Worth the Katy's line is 507 miles, the Missouri Pacific-Missouri, Oklahoma & Gulf route 556 miles, the Santa Fe 592 miles, the Rock Island 589 miles and the Frisco 573 miles. A new schedule was made by the Katy in November and the comparisons made above are under the old schedule. The new schedule somewhat lengthened the time, thus reducing the speed per hour. Even under the new schedule, however, the Katy averages 13.7 miles per hour between Kansas City and Ft. Worth, comparing with the Missouri Pacific's 11.7, the Santa Fe's 12.0, the Rock Island's 10.9 and the Frisco's 9.1. With the short line between Kansas City and Dallas under the new schedule the Katy averages 12.9 miles per hour as against the Santa Fe's 11.6, the Frisco's 8.5 and the Missouri Pacific's 12.0. With very much the shorter line between Kansas City and Waco, the Katy averages 13.9 miles per hour under the new schedule, comparing with the Santa Fe's 9.0.

The first vice-president of the Cotton Belt says that his trains are scheduled faster than they should be, although they are not trying to lead in fast time, and that the Cotton Belt is now losing on a large proportion of its freight service from 15 to 25 per cent of its locomotive efficiency on account of fast freight train schedules.

It should be possible to secure more advantageous time from St. Louis to Texas points if similar treatment is accorded competitors of the Katy with respect to time from Kansas City to the same points (another conference has been arranged for the purpose of lengthening freight schedules).

The Katy has bought 105 Mikado locomotives, and of these, 35 have a tractive effort of 60,000 lb. and the remainder of 54,000 lb. The former are well adapted to the present requirements of the business, but when increased density of traffic comes, considerably more powerful locomotives, say of the Santa Fe type, with a tractive effort of 72,000 to 75,000 lb., will be much more economical. It is figured that Mikados have 72 per cent more tractive effort than the locomotives that handled the main line business before, and this business amounts to 64 per cent of the total, so that the trainload on the whole system should be increased through the use of the Mikados by 46 per cent. In 1913 the trainload was 243 tons, and in 1916, 323 tons, an increase of 80 tons, or 33 per cent. Translating this into train-miles, with a cost of 90 cents per train-mile, there is a difference of $268,430 between what was actually saved by the Mikados replacing the lighter locomotives and what might have been saved had the trainload been increased in proportion to the increased tractive effort. The management says that as soon as side track extensions, which are now being built, are completed it will be possible to increase the length and tonnage of trains considerably.

The company introduced on April 1, 1916, a performance sheet which can be fairly criticised as too voluminous and which combines results obtained from main and branch lines. A record of the trainload obtained on a certain district by dividing the total tonnage handled on both main

and branch lines by the total number of trains run is of no practical value. The performance on branch lines, provided the business can be handled by one daily train in each direction, cannot be improved, but on the main line, where the density is great enough to require running several trains, an improvement can and should be made. It is important that the relation between the rating of each locomotive and the tonnage that it hauls every trip be compared and the proper transportation officers be held strictly responsible for the loading of engines in the direction of the maximum volume of traffic. A record of this kind is being maintained in the office of the chief operating officer at Dallas, computed from the train despatcher's sheets, but it would be more economical, apparently, to have these statements compiled on the basis of the conductors' wheelage reports in the offices of the car accountants at Parsons and Denison and consolidated in the office of the statistician at St. Louis. Operating sheets should be issued three times a month showing engine loading, fuel consumption and the transportation costs that are controllable by transportation officers. There can be no objection to computing transportation costs per ton-mile in the present day because this information is spread on the records of courts and railway commissions.

The daily performance sheet and monthly statements are self-explanatory. The recapitulation and extension is to be issued the 10th, 20th and close of each month, being a recapitulation of the entire month's performance. The daily performance sheet should be prepared by the chief despatcher in multiple, one copy being retained and the others sent to the general manager and certain other officers. The chief despatcher fills out all the columns except the last four on the right-hand side. The superintendent of transportation should prepare the ton mileage figures. The car miles for both passenger and freight performance sheets and gross ton-miles for the freight sheet and engine rating should be made directly from wheel reports turned in by the conductors. The fuel performance department should furnish the information as to total tons of fuel issued on each trip and the average consumption per thousand gross ton-miles per trip based on the figures of the superintendent of transportation. In passenger service the fuel consumption should be based on the number of pounds required per passenger per mile, or, as it is an easy matter to determine the ton-miles of passenger cars (the weight of the passengers being negligible), it should preferably be stated in terms of 100 gross tons hauled one mile. Copies of this report should be sent to the general manager and chief operating officer, and one retained by the superintendent of transportation, another by the fuel department, and one should be returned to the district superintendent, thus affording him a daily statement of the details of operation about three days after the date covered by the report.

The figures for average miles per car per day and for engine mileage should be obtained from the superintendent of transportation; the record of fuel should be obtained from the fuel department; the figures for wages of train and enginemen should be compiled from a payroll analysis furnished by the district superintendent. He should furnish basic data only, all calculations and unit comparisons being made in the office in which the form is prepared. The figures for constructive mileage and cost of helper service are also furnished by the superintendents, and all figures furnished by the superintendents should be subject to independent check at intervals. The figures for form 4 are derived from the same sources as those for form 3. The

Form 2

FREIGHT TRAIN PERFORMANCE STATEMENT FOR ..... DAYS, MONTH OF ....., 1917.
..... DISTRICT.

| | MAIN LINE | | | | BRANCH LINE | | TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | Through | | Local | | | | | |
| | This Month | Same Month Last Year | This Month | Same Month Last Year | This Month | Same Month Last Year | This Month | Same Month Last Year |
| Train Miles: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Total | | | | | | | | |
| Car Miles: | | | | | | | | |
| Loaded, north | | | | | | | | |
| Loaded, south | | | | | | | | |
| Loaded, total | | | | | | | | |
| Empty, north | | | | | | | | |
| Empty, south | | | | | | | | |
| Empty, total | | | | | | | | |
| Total, north | | | | | | | | |
| Total, south | | | | | | | | |
| Net Tons One Mile: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Total | | | | | | | | |
| Net Tons per Train Mile: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Total | | | | | | | | |
| Gross Tons One Mile: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Total | | | | | | | | |
| Gross Tons per Train Mile: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Total | | | | | | | | |
| Average Engine Rating per Train Mile: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |
| Per Cent Rating Hauled: | | | | | | | | |
| North | | | | | | | | |
| South | | | | | | | | |

| SYSTEM | 1917 Month to Date | 1916 Month to Date |
|---|---|---|
| Number of cars loaded on line | | |
| Number of loaded cars received from connections | | |
| Total | | |
| Empty car miles—Local | | |
| Empty car miles—Foreign | | |
| Empty car miles—Total | | |
| Loaded car miles—Local | | |
| Loaded car miles—Foreign | | |
| Loaded car miles—Total | | |
| Grand total loaded and empty car miles | | |

Note.—Local includes mixed.

item of engine house expenses is derived from the mechanical department payrolls and reports. The report is due five or six days after the close of the month it covers. It is meant to give the major elements of transportation cost only and does not include any reference to station service cost.

An investigation was made of locomotive performance in April, 1916, on main line divisions. The results of this investigation are shown in tabular form:

| | Miles | Gross Tons Per Day | Direction of Volume of Business | Rating of Engines | | Average Tons Per Train | Number of Trains Per Day | Class of Engine Per Cent |
|---|---|---|---|---|---|---|---|---|
| | | | | Fast | Slow | | | |
| St. Louis to Mokane | 116 | 4,912 | North | 65 Cars | 3,090 | 2,267 | 2.17 | 53 |
| Mokane to New Franklin | 63 | 5,111 | North | 65 Cars | 3,120 | 2,266 | 2.26 | 53 |
| New Franklin to Sedalia | 39 | 5,524 | North | 1,400 | 1,400 | 1,305 | 4.23 | 53 |
| Sedalia to Parsons | 159 | 5,428 | North | 2,155 | 2,155 | 1,726 | 3.14 | 60 |
| Kansas City to Parsons | 137 | 6,142 | North | 1,925 | 2,140 | 1,786 | 3.44 | 60 |
| Parsons to Muskogee | 118 | 6,371 | North | 2,100 | 2,300 | 1,909 | 3.34 | 53 |
| Muskogee to Denison | 161 | 6,939 | North | 2,100 | 2,650 | 1,932 | 3.59 | 60 |
| Denison to Ft. Worth | 99 | 5,906 | South | 1,500 | 1,590 | 1,188 | 4.97 | 54 |
| Ft. Worth to Waco | 89 | 4,625 | South | 1,875 | 2,360 | 1,636 | 2.83 | 54 |
| Waco to Smithville | 126 | 4,261 | South | 2,000 | 2,420 | 1,680 | 2.54 | 60 |
| Smithville to Houston | 116 | 1,982 | South | 2,030 | 3,880 | 1,667 | 1.19 | 60 |

The number of trains per day is obtained by dividing the total trains run over the division during the month by the number of days in the month. The hauling capacity, or rating of locomotives in tons is equated by the addition of a certain percentage for each car in excess of a given number. The figures furnish evidence that the schedules of trains are too fast. The ability of a road to load its locomotives to their full capacity, however, is dependent to a considerable extent on the character of business. In 1916 the Missouri, Kansas & Texas tonnage of freight traffic was 23 per cent agricultural products, 4.60 per cent

animal products, 40.60 per cent products of mines, 8 per cent products of forests, and 23.80 per cent manufactures, merchandise and miscellaneous. The St. Louis-San Francisco's in the same year was 15.76 products of agriculture, 3.20 products of animals, 41.38 products of mines, 14.91 forest products, and 24.75 manufactures, merchandise and miscellaneous. The St. Louis Southwestern's was 19.34 products of agriculture, 1.60 products of animals, 12.32 products of mines, 46.12 products of forests, and 20.62 manufactures, merchandise and miscellaneous. The St. Louis, Iron Mountain & Southern's was 19.53 products of agriculture, 1.86 products of animals, 30.07 products of mines, 32.79 products of forests, and 15.75 manufactures, merchandise and miscellaneous.

The Missouri, Kansas & Texas handles a larger per-

Form 3

STATEMENT OF FREIGHT TRAIN OPERATION, MONTH OF JANUARY, 1917, AND COMPARISONS.

| FREIGHT | TOTAL ALL DISTRICTS | | | ST. LOUIS DISTRICT | | | PARSONS DISTRICT | | | McALESTER DISTRICT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 |
| Miles of Road—Main Line | | | | | | | | | | | | |
| Miles of Road—Branch Line | | | | | | | | | | | | |
| Miles of Road—Total | | | | | | | | | | | | |
| Train Mileage (including Mixed): | | | | | | | | | | | | |
| Per Mile of Road—Main Line | | | | | | | | | | | | |
| Per Mile of Road—Branch Lines | | | | | | | | | | | | |
| Per Mile of Road—Total | | | | | | | | | | | | |
| Gross Tons One Mile: | | | | | | | | | | | | |
| Per Mile of Road—Main Line | | | | | | | | | | | | |
| Per Mile of Road—Branch Lines | | | | | | | | | | | | |
| Per Mile of Road—Total | | | | | | | | | | | | |
| Per Train Mile—Main Line | | | | | | | | | | | | |
| Per Train Mile—Branch Lines | | | | | | | | | | | | |
| Per Train Mile—Total | | | | | | | | | | | | |
| Net Tons One Mile: | | | | | | | | | | | | |
| Per Mile of Road—Main Line | | | | | | | | | | | | |
| Per Mile of Road—Branch Lines | | | | | | | | | | | | |
| Per Mile of Road—Total | | | | | | | | | | | | |
| Per Train Mile—Main Line | | | | | | | | | | | | |
| Per Train Mile—Branch Lines | | | | | | | | | | | | |
| Per Train Mile—Total | | | | | | | | | | | | |
| Net Tons Per Loaded Car—All Freight | | | | | | | | | | | | |
| Average Number of Cars per Train: | | | | | | | | | | | | |
| Loaded | | | | | | | | | | | | |
| Empty (exeluding Caboose) | | | | | | | | | | | | |
| Total | | | | | | | | | | | | |
| Ratio of Empty Car Miles to Total Car Miles | | | | | | | | | | | | |
| Average Mileage per Car per Day: | | | | | | | | | | | | |
| System (excluding Work and Stored Equipment) | | | | | | | | | | | | |
| Foreign (excluding Work and Stored Equipment) | | | | | | | | | | | | |
| Total (exeluding Work and Stored Equipment) | | | | | | | | | | | | |
| Engine Mileage (including Mixed): | | | | | | | | | | | | |
| Lone and Double Head | | | | | | | | | | | | |
| Total | | | | | | | | | | | | |
| Lone and Double Head Miles per 1000 Train Miles | | | | | | | | | | | | |
| Fuel: | | | | | | | | | | | | |
| Pounds of Coal per 1000 Gross Ton Miles | | | | | | | | | | | | |
| Cost of Coal per 1000 Gross Ton Miles | | | | | | | | | | | | |
| Cost of Coal per 1000 Net Ton Miles | | | | | | | | | | | | |
| Savings (†) based on consumption per 1000 Gross Ton Miles: | | | | | | | | | | | | |
| This month over last month | | | | | | | | | | | | |
| This month over same month last year | | | | | | | | | | | | |
| Wages of Train and Enginemen: | | | | | | | | | | | | |
| Dead-head—Called and not used—Enginemen | | | | | | | | | | | | |
| Dead-head—Called and not used—Trainmen | | | | | | | | | | | | |
| Road Switching Overtime—Enginemen | | | | | | | | | | | | |
| Road Switching Overtime—Trainmen | | | | | | | | | | | | |
| Other Overtime—Enginemen | | | | | | | | | | | | |
| Other Overtime—Trainmen | | | | | | | | | | | | |
| Constructive Mileage | | | | | | | | | | | | |
| Road Switching—Regular Time | | | | | | | | | | | | |
| Safety First, etc. | | | | | | | | | | | | |
| Regular Time | | | | | | | | | | | | |
| Total Wages | | | | | | | | | | | | |
| Per cent of Overtime to Total Wages | | | | | | | | | | | | |
| Per cent of Constructive Mileage to Total Wages | | | | | | | | | | | | |
| Cost per 100 Train Miles—Total Wages | | | | | | | | | | | | |
| Cost per 1000 Gross Ton Miles—Total Wages | | | | | | | | | | | | |
| Cost per 1000 Net Ton Miles—Total Wages | | | | | | | | | | | | |
| Savings (†) based on Wages per 1000 G. T. M.: | | | | | | | | | | | | |
| This month over last month | | | | | | | | | | | | |
| This month over same month last year | | | | | | | | | | | | |
| Constructive Mileage (Miles) | | | | | | | | | | | | |
| Constructive Mileage per 1000 Train Miles | | | | | | | | | | | | |
| Rank in Density of Traffic (Gross Ton Miles) | | | | | | | | | | | | |
| Rank in Wage Cost per 100 Train Miles | | | | | | | | | | | | |
| Rank in Wage Cost per 1000 Gross Ton Miles | | | | | | | | | | | | |
| Rank in Coal Consumption—Pounds per 1000 G. T. M. | | | | | | | | | | | | |

(†) Denotes loss.

centage of products of agriculture than any of the others with which it is compared, a slightly larger percentage of animals and animal products, and about the same percentage of products of mines as the St. Louis-San Francisco and a much larger percentage than the other two roads, but a smaller percentage of products of forests than any of the other roads, and a larger percentage of manufactures, merchandise and miscellaneous than any of the others except the Frisco. At present the volume of traffic of this character is almost the same on the two roads. The Missouri, Kansas & Texas gets 5.73 per cent of its ton-miles and 7.33 per cent of its earnings from the carriage of animals and animal products, and the Frisco 3.97 per cent of ton-miles and 5.8 per cent of earnings. Livestock and dressed beef are generally handled in light trains, run at high rates of speed. The ton mileage of merchandise on the Katy was 5.44 per cent of the total and produced 18.29 per cent of the total freight revenue, and on the Frisco 4.98 per cent of ton-miles and 18.96 per cent of freight revenue.

Particular attention is called to this equality in volume of merchandise business and earnings of the two roads, because notwithstanding the sharp competition between the two companies, the Frisco refrains from accelerating its merchandise trains and is able to handle this business more economically. Products of agriculture, of mines and manufactures form 80.14 per cent of the total tonnage on the Katy and 75.64 per cent on the Frisco. These classes of tonnage can be loaded so as to get large average carload. The following table shows the carloading of various classes of commodities:

| | Tons Per Car | |
|---|---|---|
| | M. K. & T. | Frisco |
| Products of agriculture | 21 | 21 |
| Animals and animal products | 11 | 12 |
| Products of mines | 38 | 42 |
| Products of forests | 24 | 25 |
| Manufactures | 22 | 25 |
| Miscellaneous | 15 | 16 |
| General average | 25 | 28 |

The average length of haul of all commodities is 214 miles on the Katy and 169 miles on the Frisco. Length of haul being an important factor in the economies of operation, the Katy should be able to make an equally good, or even better, showing than the Frisco.

In April, 1916, the total potential ton-miles on the main line divisions was 246,249,554 in the direction of volume of traffic, and the actual ton-miles 193,326,163. There was 244,040,115 potential ton-miles in the reverse direction and 157,650,033 actual ton-miles. The percentage of actual to potential ton-miles in the direction of the volume of traffic was 78.4, and in the reverse direction 64.6. The train mileage in the direction of traffic was 111,098, and in the reverse direction 109,944. The average tons per train [gross, presumably] was 1,740 in the direction of volume of traffic and 1,434 in the reverse direction. On the Frisco the potential ton-miles was 280,665,058 in the direction of volume of traffic, and the actual ton-miles 253,767,432. The potential ton-miles in the reverse direction was 259,900,394, and the actual ton-miles 197,938,070. The percentage of actual to potential ton-miles was 90.4 in the direction of volume of traffic and 76.2 in the reverse direction. The train mileage was 183,179 in the direction of volume of traffic and 181,629 in the

Form 4

STATEMENT OF PASSENGER TRAIN OPERATION, MONTH OF JANUARY, 1917, AND COMPARISONS.

| PASSENGER | TOTAL ALL DISTRICTS | | | ST. LOUIS DISTRICT | | | PARSONS DISTRICT | | | McALESTER DISTRICT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 | Jan. 1917 | Dec. 1916 | Jan. 1916 |
| Train Miles per Mile of Road | | | | | | | | | | | | |
| Average Number of Cars per Train | | | | | | | | | | | | |
| Engine Mileage: | | | | | | | | | | | | |
| Lone and Double Head | | | | | | | | | | | | |
| Total | | | | | | | | | | | | |
| Lone and Double Head per 1000 Train Miles | | | | | | | | | | | | |
| Fuel: | | | | | | | | | | | | |
| Pounds of Coal per 100 Car Miles | | | | | | | | | | | | |
| Cost of Coal per 100 Car Miles | | | | | | | | | | | | |
| Savings (†) based on Consumption per 100 Car Miles: | | | | | | | | | | | | |
| This month over last month | | | | | | | | | | | | |
| This month over same month last year | | | | | | | | | | | | |
| Wages of Train and Enginemen: | | | | | | | | | | | | |
| Total | | | | | | | | | | | | |
| Cost per 100 Train Miles | | | | | | | | | | | | |
| Savings (†) based on Wages per 100 Train Miles: | | | | | | | | | | | | |
| This month over last month | | | | | | | | | | | | |
| This month over same month last year | | | | | | | | | | | | |
| Rank in Wage Costs per 100 Train Miles | | | | | | | | | | | | |
| Rank in Coal Consumption—Pounds per 100 Car Miles | | | | | | | | | | | | |
| Train Auditors: | | | | | | | | | | | | |
| Wages and Expenses | | | | | | | | | | | | |

(†) Denotes loss.

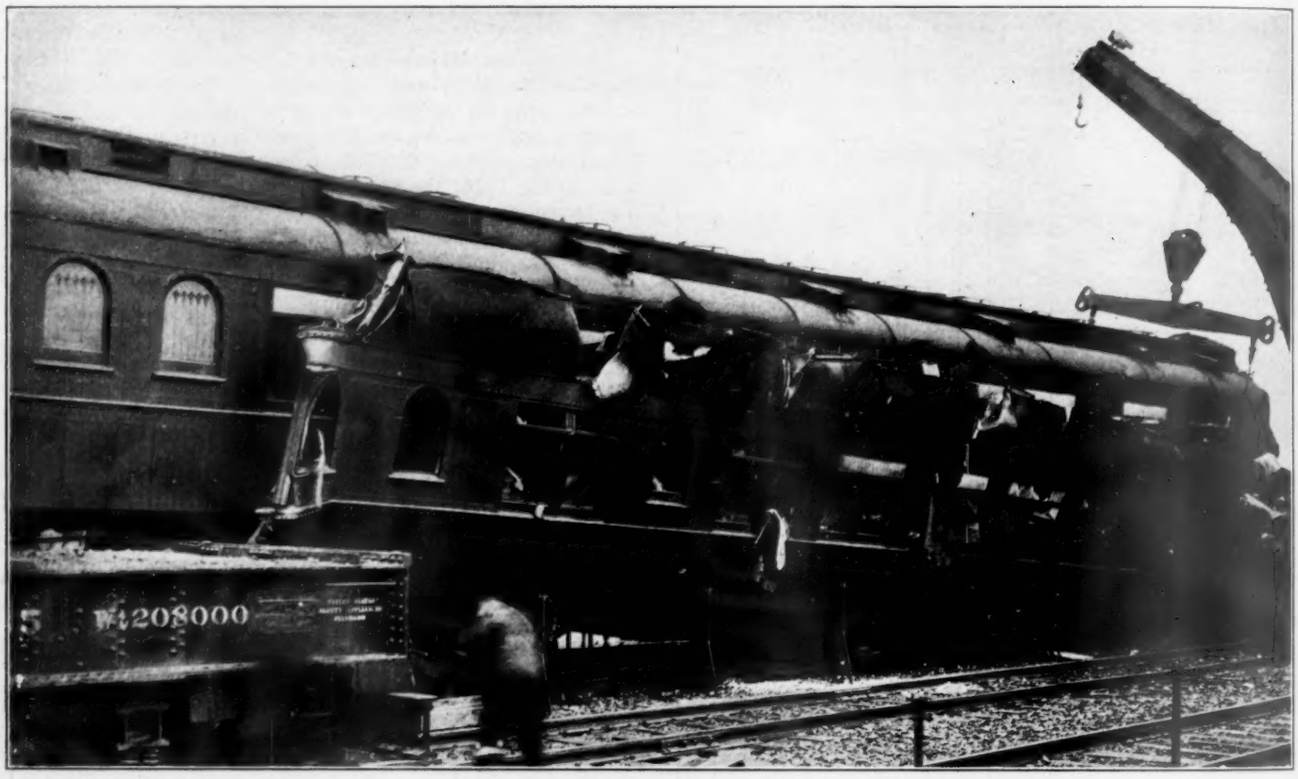
reverse direction. The average tons per train was 1,385 in the direction of volume of traffic and 1,090 in the reverse direction. Potential ton-miles represents the rating of engines used, expressed in tons multiplied by the miles run between terminals. The actual ton-miles are those as obtained from conductors' wheel or trip reports, which show all cars handled by the train, specifying numbers and initials of the cars, their contents, weight and destination.

Attention is called to the fact that the average tons per train-mile are much less on the Frisco than on the Katy. This is because in April, 1916, the Frisco had no locomotives to correspond to the 105 Mikados operated by the

Katy, which have an average tractive effort of 56,000 lb., while the maximum tractive effort of the freight engines owned by the Frisco is 49,000 lb., with the exception of 7 Mallets operated on the Birmingham division.

## MOUNT UNION COLLISION

The rear collision of eastbound trains on the Pennsylvania Railroad at Mount Union, Pa., on the morning of February 27, killing 20 persons, briefly reported last week, page 371, occurred after the passenger train had been standing at the station about 10 minutes. The investigation shows that the automatic block signals were working properly and that the freight had passed a caution and a stop signal, both set against it.




**Cars Bellwood and Bruceville; Mount Union Collision**

*Left Side of Train; the Bellwood is the Car with Wrecked Roof.*

The collision occurred 276 ft. east of automatic signal 1904, indicating stop, and 4,130 ft. east of signal 1912, which indicated caution. The flagman of the passenger train, S. K. Jacobs, had got back only about 300 ft. or 25 ft. beyond the automatic signal. The freight was fast freight P. G.—20, consisting of a consolidation engine, class H 9s, No. 614, weighing 251,000 lb., thirty-five cars and a caboose. It was running about 41 miles an hour, this rate being estimated from the time records at the last two preceding signal cabins. Engineman A. T. Cook, of the freight, who was somewhat injured, says that signal 1912 indicated white, (clear); but his fireman, H. B. Thomas, says that it was green, (caution) and that he said to the engineman "did we not have a green there?" Brakeman S. H. Barr, riding on the engine, was positive that the signal was green, and he called it twice; but, according to the fireman, the engineman insisted that the signal was white; and he took no action to reduce speed until he was within about 300 ft. of signal 1904. The grade of the road is ascending, at about one tenth of 1 per cent. The approach to both signals, 1912 and 1904, is straight, but between the two there is a curve to the right of 1 deg. 30 min. The engineman says that he did not see the flagman's signal. Brakeman Barr says that he was looking for and expected to find signal No. 1904 in the stop position; as soon as he saw that it was red (and at the same moment saw the signal of the flagman) he called to the engineman. All of the semaphore lights are electric.

Engineman Cook is about 36 years old. He entered the service of the road in 1902 as fireman. In August, 1913, he was a freight engineman; in May, 1914, he is recorded as passenger fireman; on January 21, 1916, he was made freight engineman. Since his promotion to engineman in January, 1916, he had been suspended twice for slight errors, and reprimanded once. Since May, 15, 1916, he has been subjected to efficiency tests five times, all of which were satisfactory so far as the operation of his train was concerned, two of which, however, were not considered entirely satisfactory; namely, in one case, he failed to whistle for a road crossing, and in another case, after properly observing a distant switch signal at caution, he failed to return the lever to normal after he had ascertained that the switch was properly set for a train to proceed. In January and February, 1917, his actions in regard to signals were observed by members of the staff of the road foreman of engines, and his performance was reported satisfactory. His reputation on the road so far as habits and personal conduct are concerned is of the very best. Cook does not deny that Brakeman Barr called the signal, but says that he did not hear the call. He explains his disregard of the fireman's word by saying that he (Cook) was very sure the signal was white (and that the signal for the other Eastbound track, to the left, on the same signal bridge, also was white) while the fireman was not so positive. Fireman Thomas called it "pale green." He had just risen upright after putting coal on the fire.

Cook's eyesight and hearing were tested December 31,

1915, and found satisfactory. He does not wear glasses.

Brakeman Jacobs is 28 years old and entered the service as passenger brakeman in 1911. His record shows no unfavorable entries for four years past. He had been subjected to efficiency tests 12 times in the last two years, each time in connection with the flagging rule; all were satisfactory.

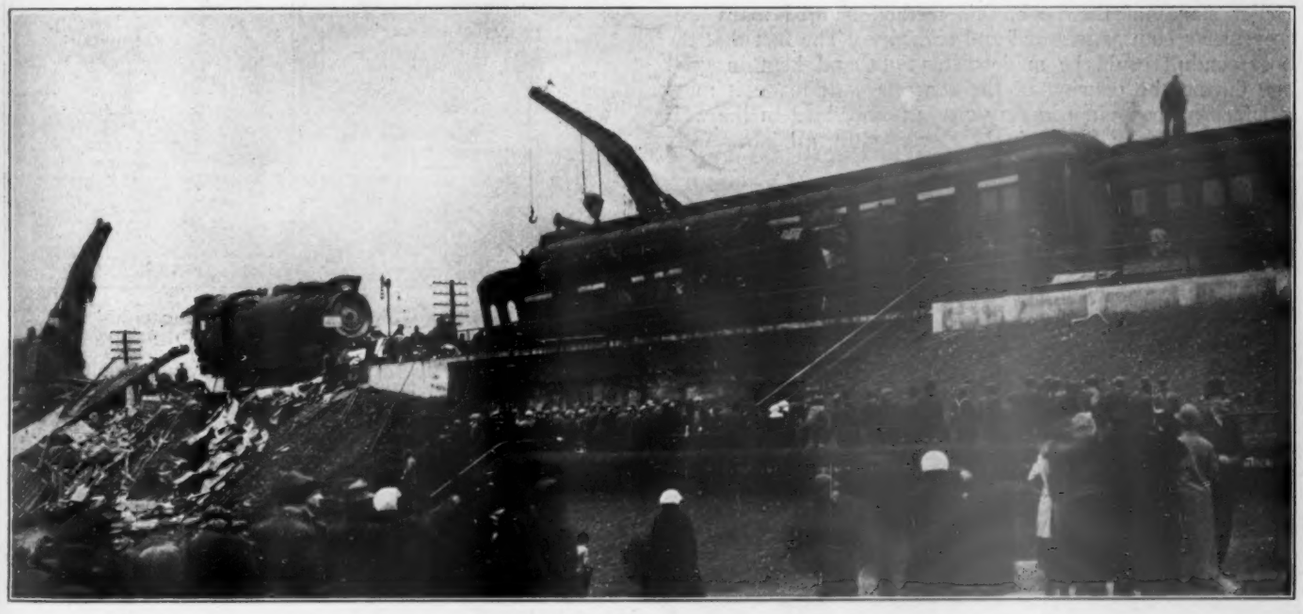
Freight fireman H. B. Thomas has been in the service since 1908, and a fireman since November, 1909. There are no unfavorable items in his record since November, 1911. Freight brakeman Barr, 35 years old, has been in the railroad service, off and on, since 1902 and has been a brakeman steadily since December 1915. There are no serious faults in his record since he entered the service the last time. This was his first trip with this crew: i. e., Cook and Thomas were not acquainted with him.

The behavior of the steel cars in the passenger train is well indicated by the illustrations. It is remarkable that greater damage was not done. The weight of the freight train was estimated to be in the neighborhood of 1,000 tons and its speed at about 40 m. p. h. when it struck the passenger train, which was standing on a tangent. The underframe of the rear car of the passenger train, the Bellwood, was wedged in between the front frame and the smokebox of the engine of the freight train, butting against the cylinder saddle. The rear end of the Bellwood seems thus to have been raised sufficiently to allow the front end of its underframe to pass underneath that of the car ahead of it, the Bruceville, permitting the underframe of the Bruceville to split open the superstructure of the Bellwood. There were no persons injured in the Bruceville and the damage is indistinctly shown in the lower left hand corner of the illustration showing the right side of the train. Had the passenger cars been of wood, far greater damage and loss of life would have occurred.

## INSTALLATION OF CONDUITS IN RETAINING WALLS

In 1913, the Chicago, Rock Island & Pacific entered on a ten-year program of track elevation in the city of Chicago, which includes several grade separation problems and other special types of construction. The method of installing conduits, in connection with the retaining wall construction, is an interesting feature of this work. Previous to this time, all automatic signal and telegraph wires had been carried on the pole lines in use prior to track elevation; but as the future development of the entire right of way was studied, it was deemed advisable to provide a conduit system in the retaining walls to care for these wires.

Various types of conduit and methods of construction were considered and used experimentally until the most efficient method was finally determined. Many difficulties were met, as rapid progress and economy in installation costs required that the conduit be placed in the retaining wall form and encased at the same time that this form was filled with concrete; also the high tension alternating current used for the automatic block signals required the two ducts used for the telegraph wires to be separated from the other ducts a sufficient distance to prevent induction and other dangers. The form of construction finally adopted is fiber conduit, made in five-foot lengths with an inside diameter of three inches and



**Collision at Mount Union, Pa., February 27—Right Side of Train**

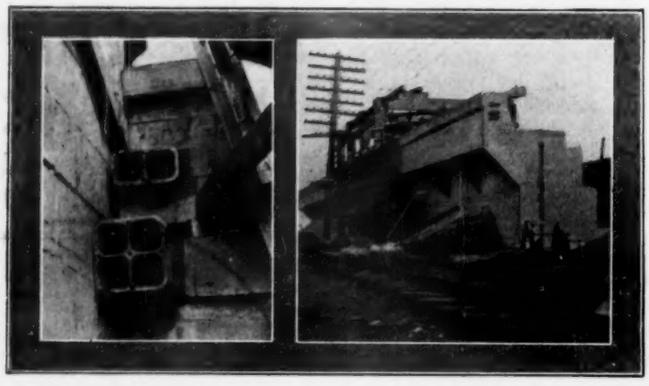
to the superstructure of the car was slight and but few windows were broken. It is credibly reported that some of the passengers in that car were not awakened by the collision! The whole train of eight steel cars and one engine was pushed forward about 200 ft.

The locomotive of the freight train was but slightly injured. The front end was crushed in and the cylinder saddle punctured by the underframe of the Bellwood. Only one pair of drivers left the rails. The tender and the first two freight cars buckled and were derailed. The freight cars were completely demolished and fell down the embankment at the side of the track. The tender cistern broke loose from its frame and rolled down the embankment also. It

tapered ends over which couplings made of the same material fit snugly in order to prevent seepage during construction.

The installation consists of a six-way conduit with the upper two ducts separated six inches from the lower four. The conduit was assembled in the retaining wall form, near the top, separation of the ducts being secured by means of ¾-in. wooden templates located at each joint of the five-foot lengths. The six ducts were wired firmly to the wooden template and were supported by and wired to rods extending through the retaining wall forms. While no trouble was experienced in keeping these ducts in a straight line and water-tight during the pouring of the concrete, the joints

were coated with a compound paint as a precautionary measure to insure water-tightness. To allow for possible settlement or lateral movement at the construction joints in the wall, the ducts were terminated four inches in from the end of one section and two inches from the end of the adjoining section, the connection through the construction joint being made with a special tin sleeve passing through a pocket left around the ducts. This pocket was then filled with a pliable asphalt mixture to make the joint water-tight



**Early Installation of Clay Conduit** **Section of Wall with Fiber Conduit**

and to allow the ducts to adjust themselves easily to any movement without damage to the cables.

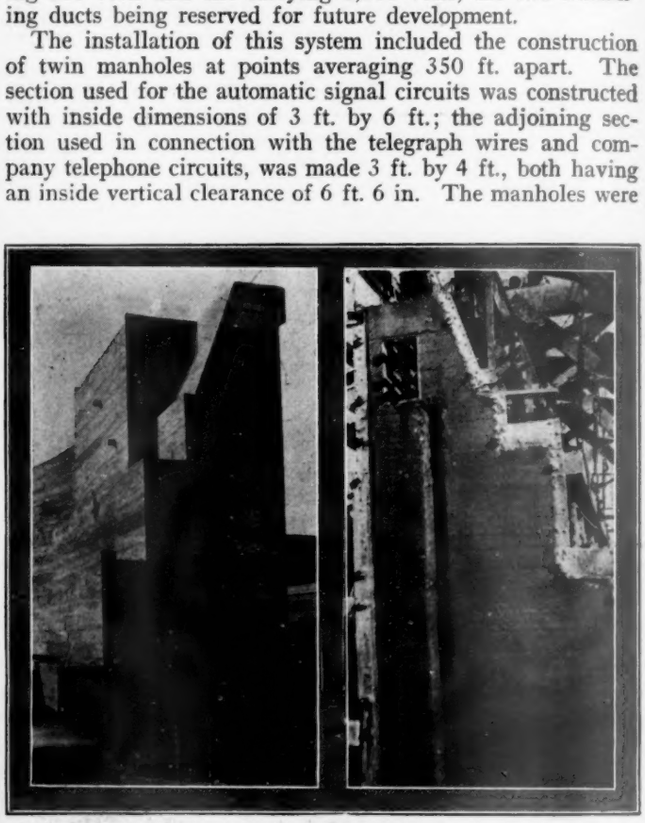
In comparison with other types of construction used in the earlier stages of the work, this method showed many improvements both as to speed and economy. The fact that the fiber conduit could be made water-tight and kept in good line during the pouring of the concrete wall made it more satisfactory than vitrified clay conduit embedded in the wall in the same manner. With the clay conduit, all joints were

**Two Views of the Method of Supporting Fiber Conduit in the Wall Forms**

wrapped with treated burlap and mopped with hot asphalt, but it was practically impossible to prevent seepage of the concrete into the ducts, filling them up to such an extent as to prevent regulation rods being passed from manhole to manhole. This was avoided in some cases by leaving a shelf in the wall on which the conduit was installed to be encased by a second operation, using a dry concrete mixed by hand or by a small capacity mixer.

Although by the nature of its construction the first cost of the fiber conduit is practically double that of clay conduit, its lightness and ease of handling effected a sufficient economy to more than offset the higher material cost. The two upper ducts of the conduit system carry two cables for the telegraph wires and also the wires for the company telephone system. The four lower ducts are used in connection with the automatic block signals and provide for one cable carrying 110 volts and one carrying 1,100 volts, the two remaining ducts being reserved for future development.

The installation of this system included the construction of twin manholes at points averaging 350 ft. apart. The section used for the automatic signal circuits was constructed with inside dimensions of 3 ft. by 6 ft.; the adjoining section used in connection with the telegraph wires and company telephone circuits, was made 3 ft. by 4 ft., both having an inside vertical clearance of 6 ft. 6 in. The manholes were



**Two Views of Joint and Manhole Construction**

so constructed that the ducts carrying the high tension automatic signal circuits were encased with six inches of concrete as they passed through the adjoining manhole. Sufficient openings were left in the manholes to provide for ground and all track circuits. Drainage was cared for by means of drain pipes leading to tile laid at the rear of all walls for the drainage of the embankment.

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ESTABLISHMENTS UNDER THE BRITISH MINISTRY OF MUNITIONS.—The establishments under the control of the Ministry of Munitions of Great Britain on January 31, 1917, numbered 4,719.

"SAFEST ROUTE VIA RUSSIA."—A large sign in a tourist office in Copenhagen reads: "Safest Route to America via the Trans-Siberian Railroad. Tickets for Sale Here." The sign is attracting the attention of a large number of Americans in Copenhagen who have been waiting for several weeks for an opportunity to return to the United States by sea. A trip from Denmark to New York by way of the Trans-Siberian Railway would cover something over 15,000 miles. The journey would be from Copenhagen to Petrograd, thence across Russia and Siberia to Vladivostok, thence by way of Japan across the Pacific and thence across the American continent to New York.

# Resistance of Passenger Train Equipment*

## Results of a Study Made With a Dynamometer Car, of Modern Cars Operating Under Actual Service Conditions

By E. C. Schmidt† and H. H. Dunn‡

CONTINUING the work on train resistance which it has been carrying on since 1907, the department of railway engineering of the University of Illinois has recently completed a series of tests undertaken to determine the tractive resistance of moderately heavy passenger trains. The tests were begun in May, 1916, and finished in August. Through the courtesy of W. L. Park, vice-president of the Illinois Central, they were made on the lines of that company between Champaign, Ill., and Centralia, on trains in regular through passenger service, and by means of a dynamometer car. The results of the tests prove that in passenger trains, as in freight trains, the specific resistance is materially affected by the

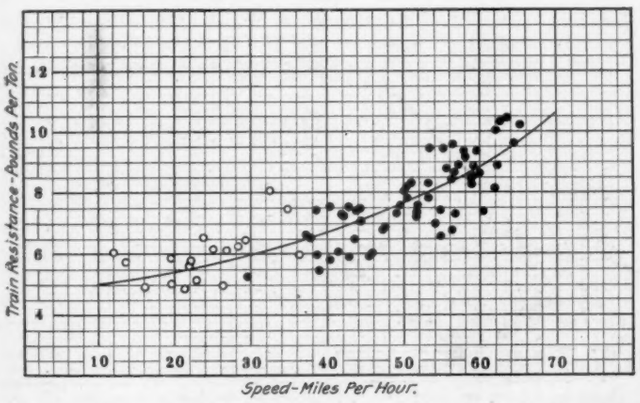



**Fig. 1—Relation Between Resistance and Speed for Test 44B**

weight of the cars composing the train, and that it decreases as the average weight of the cars increases.

*The Trains Tested.*—The trains experimented upon—18 in number—were all passenger trains, which varied in total weight from 535 to 727 tons. The number of cars varied from eight to twelve. The train make-up was not uniform and is shown for each train in the table. The average gross weight per car in the various trains ranged from 48.7 to 71.1 tons. In 13 of the 18 trains the dynamometer car was coupled with its measuring drawbar toward the rear, and in these cases its own resistance is excluded from the test car records; its weight is consequently likewise excluded from the train weights listed in the table. In the five remaining trains, on the other hand, the resistance of the dynamometer car itself is included in the records and its weight is therefore included in the train weight. Since the test car weighs only 29 tons, the normal average car weight is somewhat lowered in these five instances. All but 32 of the 187 cars included in the 18 trains had six-wheeled trucks. Other data defining the train make-up are given in the table.

All the northbound trains were "No. 2 Through Mail," whose schedule for the 124.5 miles is 3 hours and 5 minutes—a schedule speed of 40.4 m. p. h. The running time of a typical northbound train is 2 hours and 37 minutes, which is equivalent to a running speed of 47.5 m. p. h. The southbound trains, "No. 5 Fast Mail," have a schedule of 3 hours and 35 minutes, or a schedule speed of 34.8 m. p. h. A typical running time for this train is 2 hours and 51 minutes, which gives an average running speed of 43.7 m. p. h.

*Track and the Weather Conditions.*—The roadbed on which the tests were made was in good condition and the drainage, in general, was excellent. The track was especially surveyed for the purposes of these tests. Except on a few

| Test Number | Average Approximate Wind Velocity Miles Per Hr. | Gross Train Wt. Tons | Cars in Train | No. of Cars Having Three Axles Per Truck | Kind of Cars: Test Car | Baggage and Express | Mail | Coaches | Pullmans | Diner | Special |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 44A | | 604.5 | 11 | 9 | | 6 | 2 | 2 | 1 | | |
| 44B | | 570.0 | 11 | 9 | | 6 | 2 | 2 | 1 | | |
| 46A | 20.0 | 615.48 | 11 | 9 | | 4 | 4 | 2 | 1 | | |
| 46B | 15.0 | 551.32 | 10 | 8 | | 3 | 4 | 2 | 1 | | |
| 47 | 10.0 | 727.0 | 11 | 10 | 1 | 1 | 1 | 3 | 4 | 1 | |
| 48A | | 538.5 | 11 | 9 | | 5 | 2 | 2 | 1 | | 1 |
| 48B | | 562.0 | 11 | 8 | | 6 | 2 | 2 | 1 | | |
| 49A | 20.0 | 588.2 | 9 | 8 | 1 | 1 | 1 | 2 | 3 | 1 | |
| 49B | 20.0 | 634.9 | 10 | 8 | 1 | 1 | 1 | 3 | 3 | 1 | |
| 50A | 25.0 | 601.6 | 12 | 9 | 1 | 6 | 2 | 2 | 1 | | |
| 50B | 25.0 | 535.2 | 11 | 8 | 1 | 5 | 2 | 2 | 1 | | |
| 51A | 20.0 | 618.01 | 9 | 8 | | 1 | 1 | 3 | 3 | 1 | |
| 51B | 20.0 | 549.02 | 8 | 7 | | 1 | 1 | 2 | 3 | 1 | |
| 52A | 20.0 | 570.1 | 11 | 9 | | 6 | 2 | 2 | 1 | | |
| 52B | 15.0 | 540.0 | 11 | 9 | | 5 | 2 | 2 | 1 | | 1 |
| 53A | 15.0 | 708.3 | 10 | 9 | | 1 | 1 | 3 | 4 | 1 | |
| 53B | 15.0 | 639.92 | 9 | 9 | | 1 | 1 | 2 | 4 | 1 | |
| 54 | 20.0 | 606.23 | 11 | 9 | | 6 | 2 | 2 | 1 | | |

short stretches through station grounds, where cinders and screenings are used for ballast, both tracks are ballasted with broken limestone. The cross-ties, 6 in. by 6 in. by 8 ft., are spaced about 20 in. between centers and are of treated red oak, treated soft wood or untreated white oak. Sixty-one miles of the southbound track are laid with 85-lb. rail of American Society of Civil Engineers section, while the re-

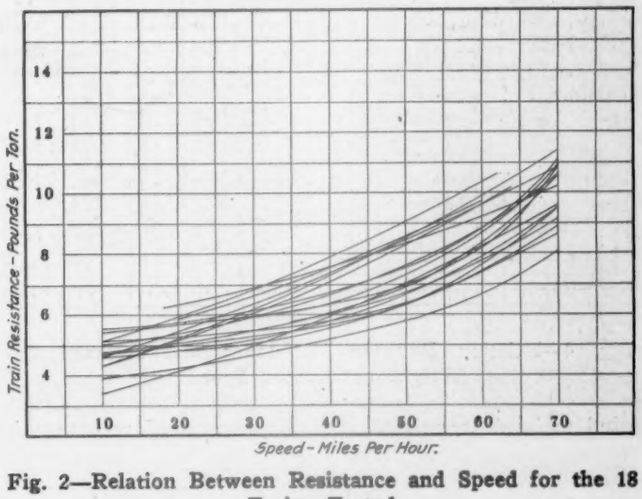



**Fig. 2—Relation Between Resistance and Speed for the 18 Trains Tested**

maining 63.5 miles are laid with 90-lb. rail of American Railway Association section. Practically all of the northbound track is laid with 85-lb. rail of American Society of Civil Engineers section. All rails are laid with broken joints supported on two ties. During eight months of the year there is employed in maintaining this portion of the

* Abstract of a paper published in Bulletin 194 of the American Railway Engineering Association.

† Professor of Railway Engineering, University of Illinois.
‡ Assistant in Railway Engineering, Engineering Experiment Station, University of Illinois.

road, a force of men averaging one man per mile of track. During the remaining four months this force is reduced to one man for each two miles.

The tests were all made on fair summer days, the air temperature which prevailed during the tests varying from 69 degrees to 93 degrees Fahrenheit. The wind velocity varied up to 25 m. p. h.

*Test Methods.*—The apparatus within the dynamometer car used produces continuous graphical records of the gross resistance of the train, the speed, time, brake cylinder pressure, wind direction and wind velocity. The net weights of all cars were obtained from the records of the

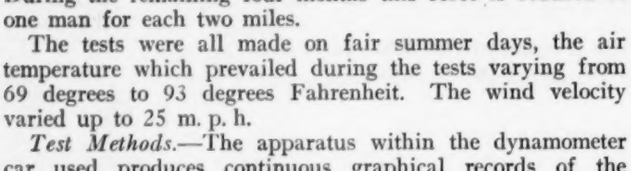



**Fig. 3—Relation Between Resistance and Average Car Weight at a Speed of 20 m.p.h.**

Illinois Central and the Pullman Company. To determine the car loads, passengers were counted and allowed for at 140 lb. each; the weights of baggage and mail were estimated by personal inspection and count of the contents of each car; the weight of express was determined by reference to the bills, supplemented by inspection and estimate. The maximum error in the gross train load itself caused by the processes described is less than 1 per cent.

All resistance values here presented have been corrected for grade and for acceleration, and they denote, therefore, the resistance of the train when running at uniform speed on level track. The data do not permit the resistance due to

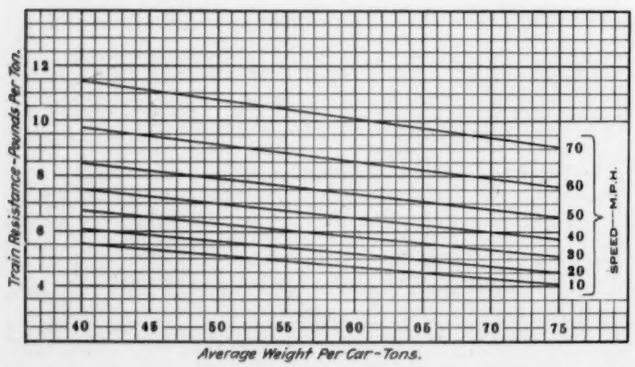



**Fig. 4—Relation Between Resistance and Average Car Weight at Various Speeds**

wind to be differentiated and this element of resistance is consequently included in the values presented. Unless otherwise stated, these resistance values are expressed in terms of pounds per ton of gross train weight.

*Test Results.*—The immediate purpose of the tests was to define for each train the relation between net resistance and speed. On the dynamometer car records for each train there were accordingly chosen a number of points or sections corresponding to as great a variety of speeds as the data presented. At each section the net resistance was calculated and the calculated value with its corresponding speed was plotted on a diagram such as Fig. 1. The curve there drawn establishes for the train in question the average relation between resistance and speed. Fig. 1 is fairly representative of the eighteen such diagrams produced during the experiments. In this figure the black dots define average value of resistance during the passage of the train over several hundred feet of track at a uniform speed; the circles define instantaneous resistance values as the train passes a particular point on the road. In this manner there has been produced for each of the eighteen trains tested a curve, like that drawn in Fig. 1, which has been accepted as defining the relation between resistance and speed. All eighteen of these curves are brought together in Fig. 2, which embodies therefore the immediate results of all the tests.

Inspection of Fig. 2 reveals a considerable divergence among the curves there drawn. At 20 m. p. h., for example, the values of resistance vary from 4.1 to 6.3 lb. per ton, and at 70 m. p. h. the values of resistance range from 8.0 to 11.4 lb. per ton. While a study of the conditions prevailing during the tests provides in a few instances other partial explanations for this divergence, it is chiefly due to the differences in the average weights of the cars composing the

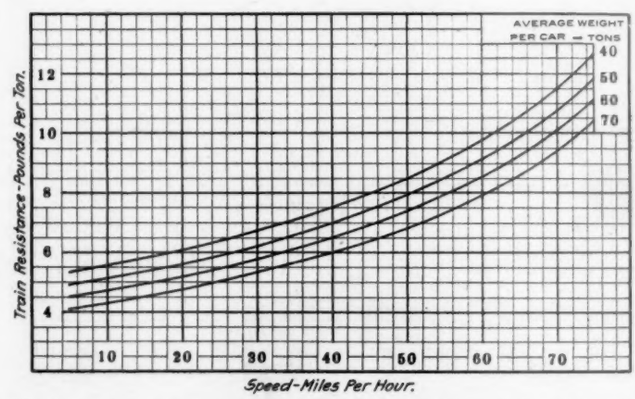



**Fig. 5—Relation Between Resistance and Speed for Cars of Various Average Weights**

different trains. Those trains composed of relatively light cars have the higher resistance (expressed in pounds per ton), whereas trains of heavy cars have a low specific resistance. This fact is better established by the process described below.

If in Fig. 2 at the point corresponding to 20 m. p. h. a perpendicular is erected, it will cut the curves in eighteen points, each of which pertains to a particular train and defines for that train the average value of resistance at a speed of 20 m. p. h. If each of these resistance values are plotted with respect to the average car weight of the train to which it pertains, the diagram shown in Fig. 3 is obtained. It is obvious that as the car weight increases, the specific resistance decreases. The average rate of this decrease is shown by the straight line. By a similar process, six other such straight lines have been determined defining this relation at speeds of 10, 30, 40, 50, 60 and 70 m. p. h. These six lines, together with those from Fig. 3, are all brought together in Fig. 4, which shows the average relation between resistance and car weight for each of seven different speeds. This figure, however, presents the relations in unusual form and Fig. 5 has been drawn from Fig. 4 to show a corresponding group of resistance-speed curves.

The relation between the two figures will be made clear by explaining the derivation of the upper curve in Fig. 5—the one applying to a car weight of 40 tons. In Fig. 4 the ordinate corresponding to an average car weight of 40 tons cuts the seven lines there drawn at seven points at which

the mean resistance values are 5.5, 6.1, 6.7, 7.5, 8.5, 9.7 and 11.5 lb. per ton, corresponding to speeds of 10, 20, 30, 40, 50, 60 and 70 m. p. h., respectively. These values are the co-ordinates of seven points on a resistance-speed curve applying to a car weight of 40 tons. These seven points have been plotted in Fig. 5 and define there the upper curve.

As these results are all derived from curves such as that drawn in Fig. 1, one must expect to encounter as much variation from the average values as is indicated in this figure. It should be borne in mind that they apply to trains running on level track at uniform speed in warm weather, and under favorable conditions. Cold weather and high winds will both operate to increase the resistance above the amounts shown.

## WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., March 6, 1917.

Not one new law directly affecting the railroads generally was placed on the statute books at the short session of the Sixty-fourth Congress, which came to a turbulent end on Sunday. Congress did take one important action for the benefit of the railroads, however, when the House passed late Saturday night the joint resolution extending until January 8, 1918, the effective date of Section 10 of the Clayton anti-trust act, which requires competitive bids under regulations prescribed by the Interstate Commerce Commission on purchases of securities or supplies or on contracts for construction and maintenance, amounting to more than $50,000 a year, between common carriers and any corporation, firm, partnership or association in which any of the carrier's directors, officers or agents are officers or in which they have any substantial interest. The resolution had been passed previously by the Senate and it was signed by the President on Sunday morning. The effective date of the law had already been once extended by Congress and the further extension was proposed because, on account of the congested condition of the calendar, it was considered impossible to obtain consideration for amendments to the law. The railroads had shown that the wording of the law was uncertain and that it apparently would impose many hampering restrictions on relations between parent companies and their subsidiaries and on many other transactions which the law was not intended to reach.

The only other action of direct interest to railroads taken at this session was the extension of time for the investigation by the Newlands committee until December. The committee is expected to resume its public hearings at an early date. Frank E. Doremus, Representative from Michigan, has been appointed a member of the committee succeeding W. E. Cullop of Indiana, who failed of re-election to Congress.

Other railroad bills which were pending before Congress were completely lost sight of in the confusion which attended the last days of the session if they had not been pigeonholed in a committee before. The bills for carrying out President Wilson's recommendations for means to compel a peaceful settlement of labor disputes did not even reach the stage of debate upon the floor of either house. The question was given careful consideration in the committees on interstate commerce and after protracted public hearings before both committees a mild form of bill providing for adding representatives of the railway companies and of their employees to the present board of mediation and conciliation, but without any provision for staying a strike pending an investigation by the board, was reported from both committees. While the strenuous opposition made by the representatives of the trainmen's brotherhoods and the American Federation of Labor to any curtailment of the power to strike or to threaten to strike undoubtedly accounted for the mildness of the provisions of the bills reported by the committees, the congestion of the Congressional program and the length of time consumed in speeches on the international situation prevented their reaching the stage of discussion on the floor. The same bills also carried an authorization to the President to take over railroads for military purposes, but after being reported they made no further progress in the legislative jam. The bill for a reorganization and enlargement of the Interstate Commerce Commission which had passed the House at the previous session was debated for a short time in the Senate, but the announced intention of the Progressives to indulge in lengthy speeches on the subject was sufficient to give it its quietus.

It is doubtful if many railroads will be affected by the "excess profits" tax included in the revenue bill passed last week, which provides for a tax of 8 per cent on corporations and partnerships on net income exceeding 8 per cent on the actual capital invested. As the bill provides that for this purpose actual capital invested means, first, actual cash paid in, second, the actual cash value of the assets at the time such assets were transferred to the corporation or partnership, and third, paid in or earned surplus and undivided profits, it will apparently require a complete valuation of each property to ascertain whether any tax is to be paid.

The appropriation for the Interstate Commerce Commission for the next fiscal year and a special appropriation of $3,500,000 for the valuation work, were included in the sundry civil appropriation bill which fell by the wayside in the Senate filibuster and which will have to be taken up at an extra session. The appropriation of $10,000,000 for the Alaska government railroad was also included in this bill but a special emergency appropriation of $3,000,000 for this purpose was put through late Saturday night.

An additional appropriation of $20,000 for the expenses of the Newlands investigation committee had been proposed as an amendment to the general deficiency appropriation bill which also failed.

## THE RAILWAYS AND THE NATIONAL DEFENSE COUNCIL

Through the prompt action taken by President Daniel Willard, of the Baltimore & Ohio, and the response by the American Railway Association, the railways are the first industry in the United States to perfect an organization and to offer their services to the secretary of war. The action of the railways and the establishment of a committee, with Fairfax Harrison, president of the Southern, as chairman, was noticed in the *Railway Age Gazette* February 23. The committee assembled at Washington March 1, and a conference was held with the secretary of war and other officers of the war department. General Joseph E. Kuhn, president of the war college, outlined the requirements of the government with particular reference to what he had observed in connection with the European war. Colonel Chauncey B. Baker, assistant quartermaster general, explained the wishes of the department in connection with mobilization, commending what the roads had done in connection with the Texas movement last summer. Dr. Franklin Martin and other medical officers discussed sanitation and hospital trains. Gen. George H. Harries, spoke for the American Electric Railway Association.

Newton D. Baker, secretary of war, expressed deep appreciation on the part of the Council of National Defense and of the government of the willingness of the railroad presidents to give their time and make the necessary journeys for the purpose of this work. He said in part:

"The purpose is an important one. It is a patriotic purpose and shows the devotion of these great railroad interests. We are in a time when war has so far changed in its character that it means, on a vastly greater scale than ever before, the instant mobilization of all the industrial resources

of the nation. Transportation is next in importance to the number and size of guns.

"In a country like ours, where transportation has been organized as the handmaid of industry, and industry comes to be connected intimately as a part of the operation of carrying on war, and the commercial, industrial, and professional classes of a nation become as much a part of the army as the men actually occupying the trenches, then a necessity arises as a logical consequence that transportation facilities should be co-ordinated so that the strategic problems of the rapid movement of troops and supplies. and concurrently the maintenance of the ordinary and daily life of the people during the course of the war, should all be thought out beforehand. In the creation of the Advisory Commission it was eminently fit that one of the presidents of the great railroad systems should be a member; and if Mr. Willard were not here it would give me a great deal of pleasure to tell you how happy the council is to have him as a member of the Advisory Commission.

"The movement of troops to the Texas border during the summer was a small problem. Our problem there was to get 150,000 men across this country from various parts of the country and to bring them together on a front 1,800 miles long. If we were suddenly put to the problem of moving an army of 500,000 men from one coast to another, or to assemble so large a body of men as that in any relatively small place, the question of the capacity of the tracks, and of cars, etc.; the way in which everything could be quickest assembled, and the effect upon the rest of the country would constitute problems of high strategy in an art of which you gentlemen are masters.

"I cannot suggest particular problems. In some parts of the country perhaps very much enlarged terminal facilities ought to be carried out, larger than the present commercial and industrial needs, with an eye to their future use in an emergency of this kind. It is possible that a large stock of reserve material should be accumulated with a view to its being available for instant use in time of emergency. . . .

"Do not rely solely upon the advice or the questions you may get from the military men, but let that ingenuity and experience which have enabled you to conduct these great enterprises in another direction have full freedom and make every suggestion that occurs to you as Americans and as citizens. . . ."

In the afternoon following the conference the railway committee held a meeting and decided on certain questions of policy and practice, after which they returned home with the understanding that each district committee would get in touch with the military commanders of their departments. It was decided that in case of any large movement of troops the transportation should be handled under the same plan of organization that was used in the mobilization of the National Guard last summer. This consisted of a central organization at Washington under the direction of George Hodges, chairman of the Committee on Relations Between Railroads, (who has been appointed assistant to the general chairman of the new committee). There was a representative in the office of the quartermaster general at Washington, one in each quartermaster's office of the four military departments, and another at each mobilization camp in each state, all reporting to the central office at Washington.

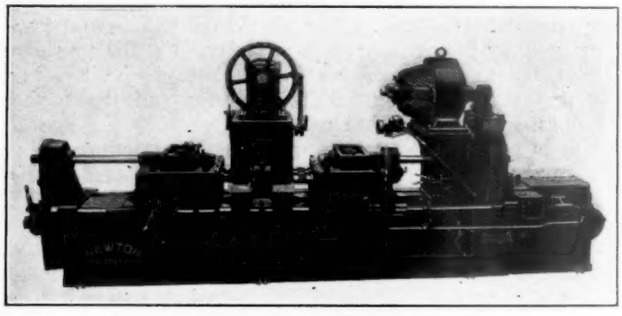
J. E. Fairbanks, general secretary of the American Railway Association, will act as secretary of the committee. It was also decided that the four territorial committees in cooperation with the department commanders should make a study of questions pertaining to the location of mobilization camps with reference to transportation facilities and to the engineering problems pertaining to terminal facilities at such points. A similar study will be made with reference to concentration points. It was also decided to appoint two committees, one of mechanical officers to study car and power questions, and to decide on standards which all roads could apply in case of an emergency, and another of traffic officers to take up with the quartermaster-general's office questions relating to the simplification of tariffs.

For this week Mr. Willard has arranged for a similar meeting at Washington of a committee representing the telephone and telegraph companies to plan for their co-operation with the military authorities. Later there will be another similar meeting of a committee on motor transportation.

At a joint meeting of the Council for National Defense and the Advisory Commission held on Saturday, March 3, Mr. Willard was elected chairman of the Advisory Commission, succeeding Dr. Hollis Godfrey.

## A RAIL DRILLING MACHINE

The Newton Machine Tool Works, Inc., Philadelphia, Pa., recently designed and built a horizontal rail drilling machine that has an adjustable elevating table to take care of rails of different sizes. It is provided with an air controlled clamp and is driven by a 15-hp. motor having a speed range of from 400 to 1,200 revolutions per minute. The design permits the drilling of close centered holes and the retention of a powerful drive. The range of the adjustment on the three-spindle head is from 4 in. to 10½ in. between centers. The central spindle is fixed while the two outside spindles are adjustable from the operating side by means of a screw. On the two-spindle head the adjustment of spindles ranges from 4 in. to 19 in. between centers. Either spindle on the two-spindle head can be brought within 1 in. of the center line of the central or fixed spindle on the three-spindle head, thus



**The Newton Rail Drilling Machine**

providing a possibility of drilling holes within 1-in. center distance.

The maximum distance between the ends of spindles is 26 in., and the length of feed motion to each spindle is 12 in., which will permit removing a full length drill without disturbing the setting of the rail. The spindle gears are all of heat-treated alloy steel.

The spindle saddle sheaves are full bearing on the base with strap and taper shoes to compensate for wear and are operated from a common pair of feed screws with right and left hand threads so that the right and left hand heads operate simultaneously. The spindle heads have four changes of feed with a rapid power traverse in both directions. The saddles are supplied with an adjustable automatic stop to the feed motion and the rapid power return has a safety limit to prevent jamming at either end of the saddle movement.

RAILWAY LOOP AROUND SHANGHAI.—A short but important railway line has recently been completed in Shanghai (west) uniting the two lines having terminals in Shanghai, namely, the Shanghai-Nanking Railway and the Shanghai-Hangchow Ningpo Railway. The junction line is 10¼ miles long.—*Commerce Report.*

# General News Department

Following recent conferences with the management of the Chicago & Alton, the telegraphers of that road were granted an increase in pay of between 9 and 10 per cent, effective March 1.

Five hundred telegraphers of the Chicago & Eastern Illinois are asking for a 15 per cent increase in wages and improvements in working conditions.

Following conferences with the management lasting several weeks, 1,400 employees of the car repair department of the Chicago & Eastern Illinois were granted an average increase in wages of one and one-half cents an hour. The advance is retroactive from January 1, 1917.

At Schenectady, N. Y., March 1, A. H. Smith, president of the New York Central, was charged with violation of the state liquor tax law and was held in $1,000 bail for appearance after the grand jury shall have acted. The offense was the selling of liquors by the railroad company on a train while it was passing through Glenville, a town in which the sale of liquor is unlawful.

An eight-position telephone switchboard of the latest type will be installed in the Southern Pacific's new office building at San Francisco, to be completed in November, one of the largest private branch switchboards on the Pacific Coast. In its present quarters in the Flood building, the company originates an average of 3,347 calls per week day, 1,951 being outgoing and 1,396 incoming.

The railway terminals committee of the Chicago city council has approved the report of the Railway Terminals Commission, J. F. Wallace, chairman, calling on the Illinois Central to electrify its lines for all train service in Chicago within 10 years. The question of making a general demand for electrification of all Chicago roads, which was reported on unfavorably by the terminals commission, was referred by the committee back to the commission, thereby killing it.

The Chicago & Northwestern's new grain elevator on the Calumet river in South Chicago, begun a year ago, is nearly finished. When completed this elevator will be the largest of its kind ever built, its capacity being 10 million bushels. It is expected to do much to relieve the present freight congestion in Chicago territory. Hundreds of cars loaded with grain are now held on side tracks for lack of elevator room. The Armour Grain Company will take over this structure immediately on its completion.

At the conclusion of the present fiscal year, the Southern Pacific will award to the six employees on each division and in each general shop, who have displayed the most interest in safety work, a gold-plated medal bearing the Southern Pacific's safety medallion, and properly engraved with the employee's name. The competitors will be graded on the basis of the number, the character and the importance of suggestions offered by them to the safety department. Last year the prize winners were each given a watch fob with a rolled gold charm.

The Chicago & North Western, in co-operation with the Iowa State Dairy Association, is running a demonstration train for the benefit of farmers residing along its lines in Iowa. The train started on February 22 and will reach the end of its route on March 15. The purpose of the train is to promote the dairy industry in Iowa, and the cars are especially equipped with modern dairy apparatus which will be used in demonstrations in over 50 cities and towns. Lectures on timely dairy subjects are being given by men from the state college of agriculture.

The New York State Public Service Commission, First District, announces the opening of a five-mile extension of the West Farms branch of the "First Subway," New York City. This is in the Borough of the Bronx, where the "subway" is an elevated structure. The new line has three tracks and extends from 177th street, northward, through White Plains road, to the city limits at 241st street. There are eleven stations on the line. Full through train service will not be put on for several months yet. The cost of this line, exclusive of its equipment, has been $2,750,000, and the work has occupied three years.

The railways in Illinois are now installing at highway crossings new hand stop signals and painting the gates with black and white diagonal stripes, as required by the order of the State Public Utilities Commission of January 10, which becomes effective on April 1. The stop signal is a white disk 16 in. in diameter, with the word "Stop" painted on it in black letters, and will take the place of the flags. To call attention to the new disk signal, the Illinois Railroad committee has sent 250,000 small folders to the secretary of state to be distributed with every automobile license. The folder contains a signed appeal of the secretary of state for the exercise of care by motorists when crossing railroads at grade. It also includes a photograph of a crossing flagman, showing the new stop signal, and places emphasis on the large number of accidents that occur each year because drivers of vehicles fail to stop, look both ways and listen.

Paul Page Whitham, an engineer, of Seattle, Wash., acting as agent of the bureau of foreign and domestic commerce of the Department of Commerce, is to go to Russia, China, Japan, East Indies and elsewhere on the other side of the earth, to make a study of existing and proposed ports and transportation facilities. The investigation will cover ports and their equipment, railways, canals, and river navigation, as well as intelligence communication facilities. The first object is to provide shipowners or operators and those interested in foreign trade full and reliable information in regard to the port and transportation facilities of the countries visited. Information will be sought concerning proposed transportation extensions and improvements, particularly in China and Asiatic Russia. Such information, the Bureau thinks, will be of great value to American investors, engineers, contractors and manufacturers. Mr. Whitham will visit a number of cities before sailing and expects to confer with trade organizations, manufacturers and others who are interested in the investigation. He expects to be abroad about two years.

During the movement of troops to and from the Mexican border the special committee on co-operation with military authorities of the American Railway Association directed the operation of trains under the general direction of the quartermaster-general of the United States army. In addition various military committees of the railroads determined the routing of troops to vaoid congestion at any gateways, or on any of the lines, and to keep the traffic spread. These committees also fixed rates and adjusted accounts between railroads. These bodies have been in existence ever since the spring of 1915, and, with the experience of the movement to and from the Texas frontier, are now in a position to run military trains to any part of the country with the least possible congestion or interference with other traffic. The western military committee, composed of E. L. Bevington, chairman; Eben E. MacLeod and J. E. Hannegan, with headquarters in Chicago, has authority over the territory west of Chicago and the Mississippi river. Since July 1, 1915, this committee has determined the routing of 226,562 troops. The other committees are as follows: Central committee, F. C. Donald, agent, Chicago; Trunk Line committee, C. L. Hunter, agent, New York; Southeastern committee, W. H. Howard, agent, Atlanta, Ga.; New England committee, W. L. Pratt, agent, Boston, Mass.

### Delaware & Hudson Steel Coaches

In the table giving comparative data on steel coaches published in connection with the article on the Delaware & Hudson steel coaches and baggage cars, in the February 9 issue on page 218, the dead weight per passenger of the Boston & Maine coaches was incorrectly stated. It should have been 1,346, which makes this car the lightest car per passenger of those given in the list. The air-brake equipment was also incorrectly stated. It should have been New York Air Brake Company's type PS equipment.

### "Safety First" Car on the N. C. & St. Louis

The Nashville, Chattanooga & St. Louis, through its safety department, will carry the campaign for reduction of avoidable accidents into every city and town on its system, and in furtherance of this purpose is fitting out a "safety first" car, which will be in charge of W. I. Brashear of the safety department. It is planned to deliver illustrated talks, and in this manner secure the active co-operation of the public. Mr. Dow's motion picture, "The House That Jack Built," is to be shown. It is also proposed to submit statistics having a local application.

### What It Costs to Misuse Pencils

The Central of Georgia furnishes its employees an average of 3,600 copying pencils, and 3,312 lead pencils each month, at an average cost of $106.15. The road has on an average 11,300 employees on its payroll each month, of whom 6,000 are furnished pencils. The lead pencils cost 0.94 cents, and the copying pencils 2.09 cents. The Central has to haul a ton of freight more than a mile to earn enough to pay for one lead pencil and nearly three miles to pay for a copying pencil. Now, if each of the army of six thousand will use just one inch more off each pencil before casting it away, about 6,000 inches of pencil would be saved each week. Figure out for yourself what that saving would be in money. I know, but I'll not tell you, because if you measure a pencil, and then figure the saving, you will be more apt to remember it. By use of the tin lengthener, a pencil can be used down to the last inch. Company doesn't furnish them? Well, what is the matter with you loosening up just for once in your life, and spending a nickel for something to be used for the benefit of the company?—J. E. Best, Passenger Rate Clerk, Central of Georgia, in the Louisville & Nashville Bulletin.

### It Can't Be Done

The January issue of The Way-Bill, published by The Traffic Club of Chicago, contains the following concise but pointed exposition of the American transportation problem: "Railroads are manufacturers. Their product is transportation. It is a commodity in which they specialize. It is the only one they produce. There are some who insist that theirs is a 'service' and not a commodity. Whichever you choose to call it, it is made by the railroad company out of raw materials and labor. The raw materials which, through competent management and labor, are fashioned into transportation are roadbeds, rails, ties, cars, locomotives, machinery, general supplies and terminal facilities. For 15 years the cost of all these raw materials, as well as of labor, has been steadily advancing, and it is still rising. For 15 years the price at which railroads have been compelled to sell their transportation has remained practically the same. There have been increases here and there, but generally speaking, rates have not risen much above the level of 15 years ago. A box car, 15 years ago, cost about $500. Today it costs approximately $2,000. The rate on grain carried in the box car from Chicago to New York, has decreased. This illustration can be multiplied by tens of thousands. In spite of the increased cost of producing transportation, do we expect the railroads to furnish not only the same but better quality, and more of it, at rates which have not been allowed to keep pace with business development? It can't be done!"

### One Reason for the Car Shortage

"If automobile manufacturers would pay less attention to the ticker-tape and more to the real business of making and selling," said R. C. Rueschaw, of the Reo Motor Car Company, "there wouldn't be nearly the railroad congestion nor the 'car shortage' there is. A lot of concerns play on the fact that the public that deals in stock-margins does not know that automobiles shipped from the factory may not be automobiles sold, though on the surface it looks like it. So they ship on dealers' allotment schedules—made some months previous. Many dealers are not prepared at this time to pay the 'sight draft,' and take deliveries, and the result is there is a carload of automobiles standing on a siding for days, weeks—yes, months, in some cases. Cars shipped in December may not be unloaded until May. Frequently, they have to be refinished before customers will accept them! Thousands of freight cars are being used in that way for storage purposes, to the end that the stock quotations may look good to speculators. A few concerns are monopolizing the freight car supply while those who have a lively demand can't ship. And, these are the biggest, best box cars the railroads have—50 ft. long, extra high, and with 10-ft. doors, made especially for shipping automobiles—and the only kind we makers of big cars can use."—*Detroit Saturday Night.*

### Educational Publicity for Railroads

L. M. Harris, manager of the press bureau of the St. Louis-San Francisco, recently prepared a card containing a few salient railroad statistics, which he has been sending to school children in rural communities to give them an idea of the magnitude of the railroad business. He intends to send other cards later with the hope that he may gradually impress upon them some of the basic principles of the transportation problem. The card, embellished with an attractive picture, reads as follows:

The miles of railroad track in the United States are 252,230. The distance from the earth to the moon is 238,850 miles. The total miles of track in Maryland, Oklahoma and Nebraska is 616 more than the difference between the miles of railroad tracks in the United States and the distance from the earth to the moon. Maryland has 1,429 miles of track. Oklahoma has 227 more miles of track than Nebraska. Who can get the total miles of track in Oklahoma and Nebraska?

### Valuation Hearing on Unit Prices

A hearing on the protest of the Texas Midland regarding the prices used in arriving at the tentative valuation of its property served on it some time ago, was commenced at Kansas City, Mo., on Monday, March 5, before examiner John E. Benson of the Interstate Commerce Commission. Director C. E Prouty represented the Division of Valuation, while Pierce Butler and Leslie Craven, attorneys for the Western Group, Presidents' Conference Committee, represented the Texas Midland. The Texas Railroad Commission was represented by R. E. Parker and the National Association of Railway Commissioners by Clyde B. Aitchison, while Glen E. Plum presented his appearance by telegraph for the railway brotherhoods as also did J. L. Bristow and A. E. Helm of the Kansas Railway Commission. Testimony was introduced regarding the application of unit prices applied to ballast, track laying and surfacing and grading, and also regarding the length of the construction period in production.

### Railway Signal Association

The regular spring meeting of the Railway Signal Association will be held at the Auditorium Hotel, Chicago, Monday, March 19, the first session beginning at 9:30 a. m. Committee No. 1 will present a report on signaling practice, dealing with the problem of signaling single track roads with reference to the effect of signaling and proper location of passing sidings on the capacity of the line; on the desirability of having an overlap in automatic signaling, and on methods of giving signal indications other than by the semaphore.

Committee No. 2 will report on field construction of pipe lines, and on locking switches mechanically at interlocking plants. Committee No. 5 will present a code of instructions for maintenance of alkaline storage batteries and some data on new developments in manual block signaling.

Committee No. 6 will present the revised drawings of a number of standards, new drawings of six standards, including location and support for a highway crossing sign, and specification for hand lantern globes.

Committee No. 7 will recommend the two-ohm track relay, and present other information concerning direct current relays. Committee No. 10 will present specifications for switchboards for use in connection with storage batteries. The special committee on lightning protection will present a specification for made grounds for lightning arresters. The special committee on harmonizing of specifications will present a report continuing the work which was laid before the convention at the last annual meeting.

The special committee on electrical testing, W. N. Manuel, chairman, will present a report on testing ground resistances, and other matter.

The Journal of the Association for March, which contains the notice of the meeting, has also several pages of information con-

cerning what has been done by regional meetings at New York, Washington, Cincinnati, Kansas City and Ogden.

All of the votes which, at the last annual meeting, were taken subject to approval by letter ballot, have been approved by the necessary two-thirds vote.

### The June Mechanical Conventions

At the first assignment of space for the Railway Supply Manufacturers' Association exhibit at Atlantic City, June 13 to 20, 70,000 sq. ft. of space was assigned to 200 companies. This amount is already almost as great as the total space used last year. Several new exhibitors have taken space, a large number of regular exhibitors have enlarged their booths and the machine tool builders will have a large representation. There is, therefore, every indication that the exhibit this year will be a record-breaker. Several important improvements have been made on the pier. Machinery Hall Extension has had a ceiling put in it, and the north side of the Annex in front of the cottage has been fitted with glass panels. The list of those who received space on the first assignment is as follows:

American Abrasive Metals Company, New York.
American Arch Company, New York.
American Balance Valve Company, Jersey Shore, Pa.
American Brake Shoe & Foundry Company, New York.
American Car & Foundry Company, New York.
American Flexible Bolt Company, Pittsburgh, Pa.
American Mason Safety Tread Company, Boston, Mass.
American Rolling Mill Company, Middletown, Ohio.
American Steel Foundries, Chicago.
American Tool Works Company, Cincinnati, Ohio.
Anchor Packing Company, Philadelphia, Pa.
Armstrong Cork Company, Pittsburgh, Pa.
Ashton Valve Company, Boston, Mass.
Associated Manufacturers of Malleable Iron, Cleveland, Ohio.
Ayer & Lord Tie Company, Inc., Chicago.

Barco Brass & Joint Company, Chicago.
Barrett Company, New York.
Bettendorf Company, Bettendorf, Iowa.
Bird-Archer Company, New York.
Bowser, S. F. & Co., Inc., Ft. Wayne, Ind.
Bradford Draft Gear Company, Atlanta, Ga.
Buckeye Steel Castings Company, Columbus, Ohio.
Buffalo Brake Beam Company, New York.
Byers, A. M., Company, Pittsburgh, Pa.

Cambria Steel Company, Philadelphia, Pa.
Camel Company, Chicago.
Carborundum Company, Niagara Falls, N. Y.
Carnegie Steel Company, Pittsburgh, Pa.
Chambers Valve Company, New York.
Chandler, W. R., Sumter, S. C.
Chase, L. C., & Co., Boston, Mass.
Chicago Car Heating Company, Chicago.
Chicago-Cleveland Car Roofing Company, Chicago.
Chicago Pneumatic Tool Company, Chicago.
Chicago Steel Car Company, Chicago.
Clipper Belt Lacer Company, Grand Rapids, Mich.
Commonwealth Steel Company, St. Louis, Mo.
Consolidated Railway Electric Lighting & Equipment Company, New York.
Crane Company, Chicago.
Crosby Steam Gage & Valve Company, Boston, Mass.
Crucible Steel Company of America, Pittsburgh, Pa.

Davis Machine Tool Company, Inc., Rochester, N. Y.
Dearborn Chemical Company, Chicago.
Detroit Lubricator Company, Detroit, Mich.
Dixon, Joseph, Crucible Company, Jersey City, N. J.
Draper Manufacturing Company, Port Huron, Mich.
Duff Manufacturing Company, Pittsburgh, Pa.
DuPont Fabrikoid Company, Inc., Wilmington, Del.

Economy Devices Corporation, New York.
Edison Storage Battery Company, Orange, N. J.
Edwards, O. M., Company, Inc., Syracuse, N. Y.
Electric Railway Journal, New York.
Electric Storage Battery Company, Philadelphia, Pa.
Elwell-Parker Electric Company, New York.
Enterprise Railway Equipment Company, Chicago.
Ewald Iron Company, Louisville, Ky.

Fairbanks, Morse & Co., Chicago.
Flannery Bolt Company, Pittsburgh, Pa.
Flint & Chester, Inc., New York.
Flower Waste & Packing Company, Bayonne, N. J.
Ford, J. B., & Co., Wyandotte, Mich.
Fort Pitt Malleable Iron Company, Pittsburgh, Pa.
Foster, Walter H., Company, New York.
Franklin Railway Supply Company, New York.
Frost Railway Supply Company, Detroit, Mich.

Galena-Signal Oil Company, New York.
Garlock Packing Company, Palmyra, N. Y.
General Electric Company, Schenectady, N. Y.
Gold Car Heating & Lighting Company, New York.
Goldschmidt Thermit Company, New York.
Gould Coupler Company, New York.
Greene, Tweed & Co., New York.
Greenfield Tap & Die Corporation, Greenfield, Mass.
Griffin Wheel Company, Chicago.

Hale & Kilburn Company, Philadelphia, Pa.
Hammett, H. G., Troy, N. Y.
Harrington, Edwin, Son & Co., Inc., Philadelphia, Pa.
Hewitt Rubber Company, Buffalo, N. Y.
Hewitt Steel Corporation, Newark, N. J.
Heywood Brothers & Wakefield Company, Wakefield, Mass.
Hunt-Spiller Manufacturing Company, Boston, Mass.

Illinois Steel Company, Chicago.
Imperial Car Cleaner Company, Newark, N. J.
Independent Pneumatic Tool Company, Chicago.
Ingersoll-Rand Company, New York.
International Correspondence Schools, Scranton, Pa.

Jacobs-Shupert U. S. Firebox Company, Coatesville, Pa.
Jenkins Bros., New York.
Johns, H. W., Manville Company, New York.
Joliet Railway Supply Company, Chicago.
Jones & Laughlin Steel Company, Pittsburgh, Pa.
Justice, Philip S., & Co., Philadelphia, Pa.

Kerite Insulated Wire & Cable Company, New York.
Keyoke Railway Equipment Company, Chicago.

Lehon Company, Chicago.
Lincoln Electric Company, Cleveland, Ohio.
Locomotive Feed Water Heater Company, New York.
Locomotive Pulverized Fuel Company, New York.
Locomotive Stoker Company, Pittsburgh, Pa.
Locomotive Superheater Company, New York.
Long, Chas. R. Jr., Company, Inc., Louisville, Ky.
Lukens Steel Company, Coatesville, Pa.
Lunkenheimer Company, Cincinnati, Ohio.

MacLeod Company, Cincinnati, Ohio.
MacRae's Blue Book Company, Chicago.
Magnus Company, Inc., New York.
Mahr Manufacturing Company, Minneapolis, Minn.
Manning, Maxwell & Moore, Inc., New York.
Massachusetts Mohair Plush Company, Boston, Mass.
Meisenhelter, L. R., Machinery Company, Philadelphia, Pa.
Metric Packing Company, Inc., Buffalo, N. Y.
Midvale Steel Company, Philadelphia, Pa.
Miner, W. H., Chicago.
Morton Manufacturing Company, Muskegon Hts., Mich.
Mudge & Co., Chicago.
McConway & Torley Company, Pittsburgh, Pa.
McCord & Co., Chicago.
McQuay-Norris Manufacturing Company, St. Louis, Mo.

Nathan Manufacturing Company, New York.
National Car Wheel Company, Pittsburgh, Pa.
National Lock Washer Company, Newark, N. J.
National Malleable Castings Company, Cleveland, Ohio.
National Railway Appliance Company, New York.
National Railway Devices Company, Chicago.
National Tube Company, Pittsburgh, Pa.
New York Air Brake Company, New York.
Niles-Bement-Pond Company, New York.
Norton, A. O., Inc., Boston, Mass.
Nuttall, R. D., Company, Pittsburgh, Pa.

Okadee Company, Inc., Chicago.
Okonite Company, New York.
Oliver Iron & Steel Company, Pittsburgh, Pa.
O'Malley-Beare Valve Company, Chicago.

Paige & Jones Chemical Company, Inc., New York.
Pantasote Company, New York.
Parkesburg Iron Company, Parkesburg, Pa.
Paxton-Mitchell Company, Omaha, Neb.
Penn Seaboard Steel Corporation, Philadelphia, Pa.
Pierce Company, Wm. B., Buffalo, N. Y.
Pilliod Company, Swanton, Ohio.
Pittsburgh Locomotive Power Reverse Gear Company, Pittsburgh, Pa.
Pocket List of Railroad Officials, New York.
Pratt & Lambert, Inc., Chicago.
Pressed Steel Car Company, New York.
Pyle-National Company, Chicago.

Quigley Furnace Specialties Company, Inc., New York.

*Railway Age Gazette*, New York.
Railway Materials Company, Chicago.
Railway Review, Chicago.
Railway Storage Battery Car Company, New York.
Railway Utility Company, Chicago.
Ralston Steel Car Company, Columbus, Ohio.
Reading Car Wheel Company, Buffalo, N. Y.
Refrigerator, Heater & Ventilator Car Company, St. Paul, Minn.
Republic Iron & Steel Company, Youngstown, Ohio.
Rivet Cutting Gun Company, Cincinnati, Ohio.

Robinson Company, Boston, Mass.
Robinson Connector Company, Branford, Conn.
Roller Lock Nut Company, Inc., New York.
Rome Merchant Iron Mill, New York.
Ryerson, Jos. T., & Son, Chicago.

Safety Car Heating & Lighting Company, New York.
Safety First Manufacturing Company, Chicago.
Sellers, Wm., & Co., Inc., Philadelphia, Pa.
Sherwin-Williams Company, Cleveland, Ohio.
Simonds Manufacturing Company, Fitchburg, Mass.
Southern Locomotive Valve Gear Company, Knoxville, Tenn.
Standard Asphalt & Rubber Company, Chicago.
Standard Car Truck Company, Chicago.
Standard Coupler Company, New York.
Standard Heat & Ventilation Company, Inc., New York.
Standard Stoker Company, Inc., New York.
Strong, Kennard & Nutt Company, Cleveland, Ohio.
Symington, T. H., Company, Rochester, N. Y.

Transportation Utilities Company, New York.

Union Draft Gear Company, Chicago.
United Engineering & Foundry Company, Pittsburgh, Pa.
U. S. Light & Heat Corporation, Niagara Falls, N. Y.
U. S. Metallic Packing Company, Philadelphia, Pa.
Universal Draft Gear Attachment Company, Chicago.

Valentine & Co., New York.
Vissering, Harry & Co., Inc., Chicago.

Warner & Swasey Company, Cleveland, Ohio.
Waugh Draft Gear Company, Chicago.
Wayne Oil Tank & Pump Company, Ft. Wayne, Ind.
West Disinfecting Company, New York.
Western Railway Equipment Company, St. Louis, Mo.
Western Steel Car & Foundry Company, New York.
Westinghouse Air Brake Company, E. Pittsburgh, Pa.
Westinghouse Electric & Manufacturing Company, E. Pittsburgh, Pa.
Wheel Truing Brake Shoe Company, Detroit, Mich.
Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass.
Wilmarth & Morman Company, Grand Rapids, Mich.
Wilson Remover Company, Newark, N. J.
Wilson Welder & Metals Company, Inc., New York.
Wood, Alan, Iron & Steel Company, Philadelphia, Pa.
Woods, Edwin S., & Co., Chicago.
Worth Brothers Company, Philadelphia, Pa.

Yale & Towne Manufacturing Company, New York.

### A. R. E. A. Convention Program

The following is the program for the annual convention of the American Railway Engineering Association, which will be held in the Florentine room of the Congress hotel, Chicago, on March 20 to 23, inclusive. The morning sessions will extend from 9:30 to 12:30, and the afternoon sessions from 2 to 5:

TUESDAY, MARCH 20

President's address.
Reports of secretary and treasurer.
Signals and Interlocking Committee report.
Electricity Committee report.
Signs, Fences and Crossings Committee report.
Water Service Committee report.
Wooden Bridges and Trestles Committee report.
Stresses in Railroad Track Committee report.
Conservation of Natural Resources Committee report.

WEDNESDAY, MARCH 21.

Track Committee report
Ballast Committee report.
Tie Committee report.
Roadway Committee report.
Uniform General Contract Forms Committee report.
Economics of Railway Location Committee report.
Yards and Terminals Committee report.
Records and Accounts Committee report.
Buildings Committee report.
Annual dinner at 6:30 p. m.

THURSDAY, MARCH 22.

Grading of Lumber Committee report.
Iron and Steel Structures Committee report.
Masonry Committee report.
Rules and Organization Committee report.
Wood Preservation Committee report.
Rail Committee report.
New business.
Election and installation of officers.
Adjournment.

FRIDAY, MARCH 23.

Inspection trip to Gary, Ind., and Buffington.

### Chattanooga Engineers' Club

This club, started last July by engineers engaged on the inventory for Industrial Preparedness, now has over 100 members. Business meetings are held each month, and noonday-lunch meetings are held every two weeks at which short and interesting talks are given relating to various branches of the profession. The following officers were recently elected for 1917: President, J. Y. Bayliss; vice-president, J. A. Fairleigh; secretary, A. F. Mellen.

## MEETINGS AND CONVENTIONS

*The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.*

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City. Next annual convention, May 1-4, 1917, Hotel Chisca. Memphis, Tenn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, May 22-25, Cincinnati, Ohio.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, Hotel Jefferson, Richmond, Va.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, Hotel Sherman, Chicago.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 22-25, Hotel Jefferson, Richmond, Va.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March 19-22, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August. Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Annual meeting, May 9-11, Louisville, Ky.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio. Annual convention, May 21-23, Chicago.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

WESTERN SOCIETY OF ENGINEERS.—F. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

# Traffic News

The Birmingham Traffic Bureau is a new institution recently established at Birmingham, Ala., in connection with the Chamber of Commerce. The traffic manager is O. L. Bunn, and his office is in the Chamber of Commerce building.

The members of the Railway Traffic Club of Springfield, Ill., held their first annual banquet on February 15. The principal speaker of the evening was R. B. Kincaid, chief of tariff bureau, Cincinnati, Indianapolis & Western, at Indianapolis, who talked on the subject of rate-making.

At a hearing before the Iowa Railroad Commission on February 27, to consider the application of the Travelers' Protective Association for a revision of baggage charges, the case of the complainants was heard, and the hearing was continued until April 5, when the railroad's arguments will be presented.

The governor of New York, acting under a law which has just been passed, looking to the time when the enlarged canal will be ready for the transportation of freight between Buffalo and Albany, is to appoint a canal traffic agent, who will collect and disseminate information relative to canal transportation.

The Atchison, Topeka & Santa Fe is helping to build up the dairy industry in the Panhandle and South Plains country of Texas. Its agricultural manager, L. L. Johnson, has obtained orders from farmers and various dairy organizations for 400 head of Holstein cows. He is going to Wisconsin and Michigan to assist in the purchase of these animals.

In addition to the three new ships now under construction for coastwise service for Morgan's Louisiana & Texas Line, the company will build six additional vessels, four of which will be for freight service between Galveston and New York and duplicates of the four large freight ships now in operation, and two of which will be passenger ships to ply between New York and New Orleans. All of the new vessels will burn oil.

The following officers were elected at the annual meeting and dinner of the Traffic Club of the Cincinnati Chamber of Commerce: Hugh M. Freer, traffic manager of the Fleischman Company, chairman; Thomas J. McLaughlin, of the Charles Boldt Company, vice-chairman; E. H. Smith, traffic manager of the Newport Rolling Mill Company, secretary. J. Van Dyke Norman, attorney, of Louisville, addressed the club on "The Evils Growing Out of Separate Ownership of the Railroads."

Eleven representatives of the Southwestern Millers' Association conferred with A. M. Schoyer, resident vice-president of the Pennsylvania Lines West, at Chicago, on March 2, to arrange to make up train load shipments of flour in 50 car trains and give them expedited movement from Kansas City and other Missouri river points. As a result of the meeting it was decided to make application to the Car Service Commission of the American Railway Association for such preferential treatment of flour from southwestern points.

In the eight months ended February 28, 1917, 446 ships, with a gross tonnage of 391,754, were built in the United States and registered under our flag. During the same period in the previous year 312 vessels of 173,537 gross tons were built and registered under the American flag. In addition to the vessels built for Americans in the year ended with last month, 13 steel vessels and one wooden vessel with a total of 39,437 gross tons, were built for foreigners. Since July 1, 1916, 152 American vessels of 180,612 gross tons were sold to foreigners, of which 76,541 were sold to Norwegians, 26,219 to British, 21,992 to French, 14,801 to Japanese, and 14,527 to Uruguayans.

Representatives of the railroads and of the National Industrial Traffic League met in Washington on March 8 to consider the advisability of making the present demurrage rules applicable permanently to interstate traffic. The Public Service Commission of Wyoming issued an order on February 27, effective on one day's notice, providing for intrastate demurrage rules identical with the interstate rules now in effect. On the basis of evidence introduced by the carriers showing that the temporary demurrage rules had the effect of greatly reducing the car shortage, the Railroad Commission of Arkansas changed the time of the expiration of the rules from February 28 to April 30. The rules in effect in Arkansas are identical with those applicable to interstate traffic.

### Proposed Increases in C. F. A. Freight Rates

The hearing on the proposed Central Freight Association class rate scale was resumed at Chicago on March 1, before W. J. Disque, examiner of the Interstate Commerce Commission. H. S. Bradley, traffic manager of the Ann Arbor, was the first witness. He stated that the lower peninsula of Michigan differed form all of the rest of C. F. A. territory in the character and volume of its traffic, in its position with reference to east and west through business and its relation to lake competition. He pointed to the fact that the adjoining states to the south benefitted by a very large east and west-bound business, whereas the traffic in Michigan was largely local because of its isolated position between the lakes. Likewise Michigan has few mineral deposits, whereas Illinois, Indiana and Ohio have large deposits of coal, petroleum and clay, which have created a large traffic. The northern two-thirds of lower Michigan is sandy and poorly developed agriculturally so that the transportation of agricultural products does not assume the proportions that it does in the more fertile states of the south. Competing bulk freight and package freight carriers on the lake have taken a large part of the business from the railroads that normally would go to them. These peculiarities of lower Michigan were amplified by Mr. Bradley to show the reason for a creation of different zones in Michigan with higher rates under the new scale than in the remainder of C. F. A. territory.

Frank H. Alfred, general manager of the Pere Marquette, introduced evidence to show that the Michigan roads did not earn as much as roads in other parts of C. F. A. territory because of the nature of the state in which they operated.

D. J. Mullen, superintendent of motive power of the Cleveland, Cincinnati, Chicago & St. Louis, introduced statistics to show the average haul of freight in C. F. A. territory, and the average revenues which would accrue under the proposed class rates. He also discussed the relation between terminal costs at Cleveland, Cincinnati, Indianapolis and other large cities in C. F. A. territory, and the proposed class rates from those points to other points in C. F. A. territory.

### Congestion Clearing Up in West

The congestion at western terminals because of the eastern freight blockade and the slowing up of train operation in cold weather, which was particularly acute a few weeks ago, is now steadily disappearing. The large western roads entering Chicago report that they have markedly reduced the number of east bound cars on their rails held up on account of eastern line embargoes. The Chicago, Burlington & Quincy has reduced the number of these cars from about 2,000 to approximately 500, or 75 per cent. The Illinois Central has effected a reduction from 3,500 to 1,500 or 57 per cent, and an officer of this road reported that conditions are close to normal, that delays are infrequent and deliveries prompt, and that he was soliciting new business. The Chicago, Rock Island & Pacific at the time of writing, has reduced the number of embargoed cars on its rails to about 50 per cent of the number during the worst congestion. The Atchison, Topeka & Santa Fe had effected a reduction of about 33 1-3 per cent, and the Chicago & Northwestern about the same amount. The switching lines in Chicago are no longer blocked and deliveries from one road to points on another within the Chicago switching district are handled almost as expeditiously as under normal conditions. Although some of the eastern lines running out of Chicago are still unable to take much freight, the Pennsylvania is beginning to take considerable, as are the New York Central and the Cleveland, Cincinnati, Chicago & St. Louis. The New York, Chicago & St. Louis is taking freight for delivery on its own lines and the Wabash is also opening up.

The danger of a coal shortage in Chicago and other western cities has passed with the movement of large quantities of coal from the Illinois and Indiana mines to the points where fuel was needed. Despite the fact that plenty of coal is to be had, prices continue high. A year ago Springfield (Ill.) district mine run coal sold at about $1.25 a ton. This winter, with the exception of periods of alleged shortage when the price went as high as $4, it has been and still is selling at from $2.50 to $3 a ton in the open market.

# Commission and Court News

## INTERSTATE COMMERCE COMMISSION

The commission has cancelled the hearing in the reopened Shreveport rate case which was set for March 12 and reassigned it for hearing on March 26, at Dallas, before Examiner Thurtell.

The commission has suspended until June 29 tariffs filed by various carriers in Official Classification territory providing for increased rates on condensed or evaporated milk, in bulk, in barrels.

The commission has suspended until September 1 increased rates on cattle, lignite and tan bark between all points in the state of Texas and between Texas points and Shreveport, La., and points taking Shreveport rates.

The commission has suspended until June 29 increased minimum rates on carload shipments of flour provided for in tariffs of the Kansas City Southern, the Missouri, Kansas & Texas, the Missouri Pacific and the St. Louis Southwestern.

The commission has suspended until June 15 proposed increased commodity rates on muriatic and sulphuric acid, carloads, in tank cars between St. Louis, Mo., and Chicago and between other points. The proposed increase from St. Louis to Chicago is from 7.4 cents to 10 cents per 100 pounds.

The commission has resuspended from March 1 until September 1 tariffs providing for increased rates on soap, less than carloads, from Kansas City, Mo., and related points to Memphis, Tenn., Cairo, Ill., Evansville, Ind., and other river crossings applicable on traffic destined to southeastern territory.

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### Southern Pacific to Keep Its Atlantic Steamship Lines

*In re Southern Pacific's ownership of Atlantic Steamship Lines. Opinion by Commissioner Meyer:*

The commission holds that the Southern Pacific may continue its interest in its Atlantic steamship lines operated between Galveston and New York, New Orleans and New York, and New Orleans and Havana. The railway, it is found, does or may compete with its lines operating between Galveston and New York, and between New Orleans and New York for through transcontinental traffic, but the railway operation of these boats is found to be in the interest of the public and of advantage to the convenience and commerce of the people.

The fleet of steamships employed in these several water line services, which is popularly referred to as the Morgan line, is directly owned by the Southern Pacific. It includes 23 ocean-going steamers, 5 of which maintain direct biweekly service in each direction between New Orleans and New York for freight and passengers; 15 maintain a direct triweekly service in each direction between Galveston and New York for freight only; 2 maintain a weekly service in each direction between New Orleans and Havana, Cuba, for freight and passengers; and one, a tank steamer, is engaged in carrying fuel oil for company use from Tampico, Mexico, to Galveston and Algiers. Some of these steamers make occasional trips between Gulf ports and Baltimore, Philadelphia, Boston and other north Atlantic ports, carrying full cargoes. These special trips, however, have not interfered with the regularity of sailings throughout the year to and from New York. While the tank steamer Topila is chiefly engaged in carrying oil for company use, it has carried cargoes for oil shippers.

The rail lines operating from the Pacific Coast through the El Paso gateway connect with the Atlantic steamship lines at Galveston and New Orleans, forming two through transcontinental routes, partly by rail and partly by water, each known as the "Sunset-Gulf route." This route provides expeditious through service for both freight and passengers from New York and Atlantic seaboard territory to the southwest and the Pacific Coast. Practically all of the transcontinental freight carried over the Sunset-Gulf route moves through the port of Galveston. All passenger traffic over the Sunset-Gulf route moves through New Orleans, and about 60 per cent of the passenger traffic carried by this steamship line is through traffic.

The record shows that the Southern Pacific's rail system and its rail connections form all-rail transcontinental routes via the El Paso gateway and via the Ogden gateway, and that these all-rail routes engage in the "most active and vigorous competition" with the Sunset-Gulf route.

There was much testimony of record tending to show that the fact that the Morgan line is the only regular steamship line operating between New York and New Orleans is attributable in a large measure to the joint ownership of the connecting rail and water lines of the Southern Pacific system.

From the record, however, it seems clear that the service furnished by these lines between New York and Galveston, and New York and New Orleans, is in many respects highly satisfactory to the shipping public. The regularity of the sailings, the frequency of the service, the expedition with which through shipments are handled, and the promptness in adjusting claims for damage and overcharge were testified to by numerous shippers. The efficiency and excellence of the present service over both of these routes appears not to be questioned. Rarely does a record before us present an array of witnesses whose testimony so uniformly indorses the character of the service as does this record.

The petitioner urges that the high character of the service is directly attributable to the fact that these steamship lines are owned by it. The commission, however, says that even if the Southern Pacific had no financial interest whatever in the Morgan line it would still have a strong incentive to work in conjunction with the Morgan line for transcontinental traffic. It appears that the Southern Pacific rail system, in conjunction with such a water line, can make better transcontinental rates and give quicker through service than any all-rail transcontinental route. The maximum traffic possibilities of the Southern Pacific rail system depend on the development of through traffic over the Sunset-Gulf route.

The petitioner also contends that its ownership of these steamship lines has had the effect of securing lower rates for the shipping public. It does not appear from the present record that the railroad ownership of this boat line has had any tendency in itself to reduce rates.

New Orleans is the one community which qualified its support of the application regarding these steamship lines. The New Orleans Joint Traffic Bureau intervened and submitted evidence tending to show that the petitioner so operates these steamship lines as to discriminate against New Orleans and in favor of Galveston. None of these shippers advocated a divorcement of the steamship lines from the Southern Pacific system. It seems manifest that in a proceeding of this character it is not appropriate for the commission to undertake to pass upon the relative or absolute reasonableness of particular rates. To the extent that the rate policy of a steamship line may be attributed to the fact that the line is owned by a railroad company, such rate policy may properly be considered in determining whether a continuance of the railroad ownership or operation is in the public interest. It does not appear, however, that the rate relationship above referred to is the result of the petitioner's control of these lines. The rate structure, so far as the record discloses, has resulted from considerations which an independent steamship management might well take into account in the fixing of port to port rates.

The present record discloses a widespread practice of applying on interstate traffic subject to the jurisdiction of this commission rates which are not lawfully on file. There are no through rates from interior Atlantic seaboard points via the Morgan line to Galveston. The Morgan line, in connection with its port to port rates from New York to Galveston, absorbs the rail rates from certain interior points to New York, but these port to port rates are not filed with the commission. The record shows that it is not uncommon for rail carriers to receive shipments at interior points in Atlantic seaboard territory billed by the shipper, care of the Morgan line, to a consignee at Galveston. Such shipments are carried by the rail carrier to New York, there delivered by the rail carrier to the Morgan line, and then carried by the Morgan line direct to Galveston. Shipments of this character clearly appear to be through shipments subject to the provisions of the act to regulate commerce and the failure of the Morgan line to file its rates applicable upon such shipments appears indefensible.

There are joint through ocean-and-rail rates from New York via the Morgan line to interior points in Texas. It appears, however, that the combination of the unfiled port to port rates from New York to Galveston and the Texas state rates from Galveston to interior points in Texas makes lower through rates than these lawfully established through rates. A practice has grown up of applying to shipments which it would seem from the record are in fact through shipments from New York to interior destinations in Texas the combination rates based on Galveston, and thus defeating the lawful through rates. It was admitted by officers of the petitioner that a large part of the traffic from New York to interior Texas points moved to Galveston on the port to port rate, and from Galveston on the intrastate rate, and that the through interstate rates were rarely applied to Texas points to which the combination rates were lower.

The correction of the objectionable practices above referred to would, however, leave no basis to justify the withholding of the finding, that the service of these steamship lines is in the interest of the public and of advantage to the convenience and commerce of the people. The case will be held open for a period of 60 days, during which time the petitioner will have an opportunity to readjust the practices in question so as to bring the service into full conformity with the provisions of the act to regulate commerce. (43 I. C. C., 168.)

## STATE COMMISSIONS

A bill was passed in the lower house of the Utah legislature last week providing for the creation of a public utilities commission. The bill is the same as that previously passed by the senate, with the exception of a few amendments, and as amended is now being considered by the upper house.

A bill was passed in the Illinois state legislature recently consolidating various state commissions into a smaller number of bodies. Under the new organization the State Public Utilities Commission becomes a part of a Department of Trade and Commerce, but will retain practically the same powers and organization. The act becomes effective on July 1.

## COURT NEWS

### Goods Stolen by Railroad's Employees

A carrier published two rates for the transportation of tin, the lesser one being based on a released valuation. A shipper, knowing of the two rates, paid the lesser and accepted a bill of lading with the usual condition, whether or not the loss occurred from negligence. The servants of the carrier stole some of the tin while in transit. The Circuit Court of Appeals, Sixth Circuit, holds that as the servants were not acting for the benefit of the carrier, so as to enable it to confiscate the tin, the carrier was liable only for the released valuation.—Moore v. Duncan, 237 Fed., 780.

### Notice of Damages to Live Stock

The Utah Supreme Court holds that a stipulation in a contract of shipment of live stock for written notice of damages for injury in transit, from delay or from decline in the market due to delay, to its station agent before removal of the stock, was unreasonable and unenforceable because it did not give the shipper a fair and reasonable opportunity to state the causes and probable amount of the loss or damages.—Baird v. D. & R. G. (Utah), 162 Pac., 79.

### Injuries to Persons Working About Cars

In an action for personal injuries to a boy, 11 years of age, caused by his falling under the wheels of a stock car while it was being moved by hand, in connection with loading some stock belonging to the boy's father, the Springfield (Mo.) Court of Appeals holds that the railroad was not negligent because its agent permitted the boy to assist in moving cars along a track where the ties extended above the ground so that he tripped, where such construction was usual. Nor was it negligent because the agent permitted the boy to pass out of his sight to the forward part of the car.—Dunscomb v. Lusk (Mo.), 190 S. W., 397.

### Notice of Claim for Damage to Live Stock

The Oklahoma Supreme Court holds that compliance with the provisions of a contract for the carriage of live stock, requiring that notice of any claim for damages for loss of or injury to, or detention of, said live stock, or delay in transportation thereof, shall be given to the carrier within one day after delivery of said live stock at its destination, and before such stock is removed from the place of destination and mingled with other stock, is a condition precedent to an action for the recovery of such damages.—Rock Island v. Brightwell (Okla.), 162 Pac., 484.

### Excessive Damages

An award of $250 to each of two young women against a railroad for requiring them to ride in a coach with negroes was, by the Arkansas Supreme Court, held excessive and reduced to $50 each, where the evidence showed that they rode only three or four miles, that their escorts were in the other compartment of the car, that the conductor's wife was in a seat across the aisle from them, and that they were invited into the negro compartment because the other compartment of the car (there was only one on the train) was crowded with men, many of whom were smoking.—Rock Island v. Allison (Ark.), 191 S. W., 15.

### Improbable Testimony

The Louisiana Supreme Court dismissed the suit of a widow for damages for the death of her husband because of the insufficiency of the evidence to prove the alleged negligence of the defendant railroad company. Some months later a similar suit was brought in behalf of the minor children for the death of their father. In this action additional evidence was adduced, consisting of the testimony of a newly discovered woman witness that she actually saw the train strike the deceased while he was lying in full view on the end of a cross-tie, but never disclosed the fact to the widow, her friend and neighbor, or to any other person except her father. A verdict for $1,500 was rendered in the plaintiff's favor. The Supreme Court set aside the judgment and dismissed the case, the newly discovered evidence being in itself improbable and suspicious, and when contradicted in several material particulars, unworthy of serious consideration.—Mercier v. Yazoo & M. V. (La.), 73 So., 710.

### Employee's Acceptance of Benefits as a Defense

In a railroad employee's action for personal injuries, the statement of claim alleged a common-law right of action, and did not plead the federal employes' liability act, nor state facts showing that the railroad company and the employee were engaged in interstate commerce at the time of the injury. The Pennsylvania Supreme Court holds that after the expiration of the two-year period of limitation prescribed by the act, the employee could not amend his statement of claim so as to bring his action within the scope of the act; for that would allow the introduction of a new cause of action. In such case, where the employee had accepted benefits as a member of the defendant railroad company's relief association, and was thereby precluded from recovering at common law, he cannot, after expiration of the two-year period of limitation, amend his statement of claim so as to bring his action within the federal employers' liability act, which provides that the acceptance of such benefits shall not be a defense.—Hogarth v. P. & R. (Pa.), 99 Atl., 741.

### Injuries "Arising Out of and in Course of Employment"

A claimant under the Michigan Workmen's Compensation Act was employed in railroad track construction, and did not receive pay for time and transportation going to and from work, but was paid by the day and at the end of the day's work owed his employer, the railroad company, no further duty until next morning. He lived in a bunkhouse furnished by the railroad at his pleasure, and could live where he chose. He remained near the bunkhouse after finishing work until dark, and then took his customary and shorter route to town along the company's tracks, instead of a parallel highway, which was safe. He was struck by one of the railroad's trains. The Michigan Supreme Court holds that, although the protection of the law extends to reasonable time and space for the employee by the day to leave his place of work, the claimant's injury did not "arise out of

and in the course of his employment" to entitle him to compensation under the act.—Guastelo v. Michigan Central (Mich.), 160 N. W., 484.

### Abandoning Intoxicated Passengers

The employees of a railroad refused to permit an intoxicated passenger to re-enter the train after leaving it at a station. The passenger left the station and went to a livery stable where he was taken charge of by an officer, but subsequently was released and directed to the station of another railroad company. He was killed on the tracks of that company. In an action for his death again the first railroad company the Illinois Appellate Division held that, while it is negligence for the servants of a railroad to abandon a passenger in a known place of danger where the passenger is bereft of reason and without intelligence sufficient to enable him to care for himself by reason of intoxication and is known by the railroad's servants to be in that condition, the act of the defendant's servants in refusing the passenger re-entry into the train was not the proximate cause of his death, and no recovery could be had.—O'Rourke v. L. & N., 197 Ill. App., 45.

### Conductor's Duty to All Passengers Alike

Where an able-bodied young woman was injured in alighting from a train, while carrying two hand-bags, and not requesting assistance, although the conductor had promised to help her, the Alabama Supreme Court holds that her injury could not be referred to the negligence of the conductor. Aside from passengers under known physical or mental disability, it is the conductor's duty to care for all passengers alike. The conductor was under no public general duty to handle the plaintiff's grips for her, nor was there anything in her condition that raised a special duty as to her. This is a reasonable rule in view of provisions made for checking unwieldy baggage.—L. & N. v. King (Ala.), 73 So., 456.

### Excessive Damages

In an action against a railroad under the Kansas factory act for injury to the plaintiff's right hand from a circular saw in the car repair shop in which he worked, which injury left him practically the use of only one finger on the hand, the Kansas Supreme Court holds, on the railroad's objection, that a judgment for $8,000 is excessive. The court pointed out that if the plaintiff and the railroad had elected to come under the workmen's compensation act the award could not have been in excess of 30 per cent of his preceding average weekly wages for eight years, and that would not amount to $2,803; and, while the compensation act was in no way controlling in the case, the illustration drawn from its provisions gave some light on the railroad's grievance. The plaintiff was given the option of a judgment for $5,000 or a new trial.—Truman v. Kansas City, M. & O. (Kan.), 161 Pac., 587.

## UNITED STATES SUPREME COURT

The workmen's compensation laws of New York, Iowa and Washington were sustained by decisions of the Supreme Court on Monday handed down by Justice Pitney. The New York law is a compulsory one providing for a graduated system of payments to employees by their employers, based on earning power. The Iowa law is an elective one providing for countributions by employers based on a percentage of the payroll. The Washington law provides for compulsory payments by employers to a fund administered by the state, the payments being apportioned in accordance with hazards of the business. The decision sustaining the Washington law was by a divided court, Chief Justice White and Justices Vandevanter, McKenna and McReynolds dissenting.

The Supreme Court on Monday in a decision by Justice Brandeis in the case of Swift & Co. vs. Hocking Valley Railway affirmed a judgment of the supreme court of Ohio sustaining the validity of a demurrage rule providing for the assessment of demurrage on private cars standing on the industrial track of the owner. In the lower court counsel for both sides had filed a stipulation that the industrial track leased by Swift & Co. from the railway at a nominal rental of $2.50 a month should be considered as a private track. The Supreme Court treated this stipulation as a nullity, however, and held that the track was in fact a railroad track and that demurrage should be paid.

# Railway Officers

### Executive, Financial, Legal and Accounting

Henry Holmgren, chief clerk in the auditing department of the Pullman Company, has been appointed auditor of disbursements, succeeding A. A. Cummings, promoted.

C. W. Huntington has resigned as chairman of the board and executive committee of the Virginian Railway, and has been elected president, with headquarters at New York, succeeding Raymond Du Puy, resigned. A portrait of Mr. Huntington and a sketch of his railway career were published in the *Railway Age Gazette* of December 15, 1916, page 1110.

Edward E. Kerwin, superintendent of the Minneapolis & St. Louis at Watertown, S. D., has been elected vice-president of the Virginian Railway in charge of operation of its property, with headquarters at Norfolk, Va. He was born on December 18, 1861, at Turner, N. Y., and began railway work on August 1, 1871, on the New York, Lake Erie & Western, now the Erie, and served as a waterboy and section laborer until March, 1883. He was then a telegraph operator and station agent on the same road, and later was telegraph operator and station agent on the West Shore. From March, 1885, to April, 1886, he was with the Union Pacific as telegraph operator, and then went to the Chicago, Milwaukee & St. Paul as telegraph operator and station agent on the Council Bluffs division. Two years later he went to the Chicago Great Western, serving as telegraph operator, station agent and train despatcher. From March, 1890, to June, 1902, he was in the service of the Iowa Central as train despatcher for two years, then chief despatcher two years, and later trainmaster for eight years. In June, 1902, he was appointed trainmaster on the Central of New Jersey, and the following October was promoted to superintendent of the Central and the Lehigh & Susquehanna divisions. He remained in that position until February, 1914, when he went to the Minneapolis & St. Louis as general superintendent, at Minneapolis, Minn.; he was later made superintendent at Watertown, S. D., and now leaves that company to become vice-president of the Virginian Railway, as above noted.

E. E. Kerwin

Roy Terrill, assistant to the president of the Gulf Coast Lines, with office at New Orleans, La., has been elected vice-president with the same headquarters. He was born at Houston, Tex., on February 18, 1876. He graduated from the South Carolina Military College at Charleston, S. C., in 1897, and in the same year entered railway service with the Missouri, Kansas & Texas. On February 1, 1899, he was appointed soliciting agent for the St. Louis-San Francisco at Dallas, Tex., and was later transferred to St. Louis, Mo., as soliciting freight agent. Subsequently he was reassigned to the Dallas office as traveling freight agent. Several years later he was promoted to commercial agent, with the same headquarters, and then was advanced to general freight and passenger agent of the Beaumont, Sour Lake & Western and the New Orleans, Texas & Mexico jointly, at that time subsidiaries of the Frisco lines. When these properties were consolidated with the St. Louis, Brownsville & Mexico in 1910, he was appointed assistant general freight agent, with headquarters at New Orleans, and continued in that position until June 1, 1916, when he was appointed assistant to the president. His election as vice-president was effective on February 16.

Hunter H. Laughton, whose appointment as assistant to vice-president in charge of operation of the Southern Railway System, with headquarters at Washington, D. C., has already been announced in these columns, was born at Richmond, Va. He was educated in the public schools of his native town and at Columbia University, Washington, D. C., and began railway work on October 1, 1885, with the Richmond & Danville, now a part of the Southern Railway System. In March, 1887, he was appointed clerk in the freight auditing department, and from December, 1889, to April, 1894, he was general clerk in the auditor's office and special traveling auditor. He was then appointed chief clerk in the disbursing department, remaining in that position until January, 1901, when he became auditor of disbursements. On February 1, 1909, he was appointed auditor, and now becomes assistant to vice-president of the Southern Railway System, as above noted. Mr. Laughton's entire railway service has been with the Richmond & Danville, and its successor, the Southern Railway.

Dewitt C. Moon, whose appointment as assistant to the vice-president of the New York Central, lines west, with office at Cleveland, Ohio, has already been announced in these columns, was born at Stockton, N. Y., on July 24, 1856. He entered railway service in 1872 as a telegraph operator and agent for the Dunkirk, Allegheny Valley & Pittsburgh. In 1874, he was appointed train despatcher, and in 1889 was made clerk in the auditor's office and freight tariff clerk. From 1890 to 1893 he was trainmaster and from 1893 to 1896, assistant superintendent. On August 1, 1896, he was promoted to division superintendent. From April, 1899, to August, 1902, he was superintendent of the Rome, Watertown & Ogdensburg division of the New York Central & Hudson River with headquarters at Watertown, N. Y., and from August 1902, to September 1903, he was assistant general superintendent of the Lake Erie & Western with office at Indianapolis, Ind. On September 1, 1903, he was appointed assistant general superintendent of the Lake Shore & Michigan Southern and on November 1, 1905, became general superintendent of that road, and also of the Lake Erie & Western, the Lake Erie, Alliance & Wheeling and the Dunkirk, Allegheny Valley & Pittsburgh. In February, 1906, he was appointed assistant general manager and in December, 1907, was promoted to general manager. He was appointed general manager of the New York Central, lines west, with office at Cleveland, Ohio, in January, 1915, and continued to fill that position until his promotion to assistant to the president, noted above.

### Operating

C. W. Fisher, chief train despatcher of the Canadian Pacific at Lethbridge, Alta., has been transferred to Souris, Man.

G. S. Everett, acting assistant superintendent of the Kansas City, Mexico & Orient, has been appointed superintendent, with office at Wichita, Kan.

F. G. Gurley, trainmaster of the Chicago, Burlington & Quincy, lines west of the Missouri river, with office at Casper, Wyo., has been transferred to Alliance, Neb., succeeding J. E. Johnson, transferred.

A. T. Mercier, division engineer of the Southern Pacific at Los Angeles, Cal., has been appointed assistant superintendent, with office at Dunsmuir, Cal., succeeding G. V. Gillette, assigned to other duties.

James Berlingett, assistant general manager of the Virginian Railway at Norfolk Va., has been appointed general manager, with headquarters at the same place, and his former position has been abolished.

C. W. Brown, assistant superintendent of the Lehigh & New England at South Bethlehem, Pa., has been appointed superintendent, with office at South Bethlehem, vice E. H. Shipman, promoted, and the office of assistant superintendent has been abolished.

M. A. Mulligan, superintendent of the New York division of the Lehigh Valley at Jersey City, N. J., has been appointed superintendent of the Mahanoy & Hazleton division, with headquarters at Hazleton, Pa., vice George J. Gildroy, whose resignation because of illness has been accepted with regret. Sidney S. Stone, special agent in the operating department at South Bethlehem, has been appointed superintendent of the New York division, with headquarters at Jersey City, N. J., vice Mr. Mulligan, promoted.

I. E. Palmer, assistant superintendent of the Chicago Great Western at Chicago, Ill., has been appointed superintendent, with headquarters at St. Paul, Minn., succeeding J. W. Mulhern, assigned to other duties; C. J. Kavanaugh, superintendent of the Canadian Pacific at Montreal, Que., has been appointed assistant superintendent of the Chicago Great Western at Chicago, Ill., succeeding I. E. Palmer, promoted.

J. J. Pierce, passenger trainmaster of the Delaware, Lackawanna & Western, at Hoboken, N. J., has been appointed assistant superintendent, with office at Hoboken, N. J., vice F. M. Benning, promoted; J. E. Church, freight trainmaster at Port Morris, has been promoted to passenger trainmaster, with office at Hoboken, N. J., vice Mr. Pierce, and F. S. McDonnell, assistant trainmaster at Scranton, Pa., has been appointed freight trainmaster, with office at Port Morris, N. J., vice Mr. Church.

N. P. Thurber, whose appointment as superintendent of the Chicago, Milwaukee & St. Paul with headquarters at LaCrosse, Wis., has already been announced in these columns, was born at Muscoda, Wis., on September 19, 1872. After working during the summer months as an extra operator on the Prairie du Chien division of the St. Paul, he entered the service of the Milwaukee & Northern, now the Superior division of the St. Paul, as an operator in 1889. Later he was made night operator on the Chicago & Council Bluffs, now the Iowa division of the St. Paul. In December, 1895, he was promoted to assistant train despatcher and from that time until February, 1917, was consecutively chief despatcher, train master and acting superintendent.

E. G. Goforth, trainmaster of the International & Great Northern at Mart, Tex., has been appointed superintendent of the Fort Worth division, with headquarters at Mart, vice J. C. Resch, promoted, and the position of trainmaster has been abolished; J. W. Knightlinger has been appointed superintendent of the Gulf division, with headquarters at Palestine, vice J. L. Burd, granted indefinite leave of absence; F. S. Schwinn has been appointed assistant superintendent of the Gulf division, with headquarters at Palestine, Tex., vice E. M. Moursund, resigned, and T. J. Hunt, roadmaster at Troup, has been appointed assistant superintendent of the Fort Worth division, with headquarters at Mart, Tex.

P. O. Wood, who has just been appointed superintendent of the Southern division of the St. Louis-San Francisco, with headquarters at Memphis, Tenn., was born at Memphis on June 8, 1875. He entered railway service in 1891, as a machinist's apprentice with the Kansas City, Memphis & Birmingham, now a part of the Frisco system. Up to 1901 he served in various capacities in the mechanical department of this road and then entered the employ of the Illinois Central as a fireman, later returning to the Frisco shops at Memphis. In 1903 he was made a fireman for the Frisco, and in 1907 became an engineer. On February 1, 1911, he was appointed assistant superintendent of locomotive fuel service, being promoted on February 1, 1914, to assistant superintendent of locomotive performance, with headquarters at Springfield, Mo. Several months later he was made superintendent of locomotive performance for the entire system. In 1916 he was appointed assistant general superintendent of motive power and continued in that position until his appointment as division superintendent became effective.

### Traffic

D. F. Coyle has been appointed industrial commissioner of the Canadian Northern Railway System, with headquarters at Winnipeg, Man.

John J. Burrows, general baggage agent of the Buffalo, Rochester & Pittsburgh, at Rochester, N. Y., will retire from active service on May 1.

W. B. McGroarty, general agent of the Southern Railway System at Baltimore, Md., has been appointed district freight agent, with office at Baltimore.

James Orr, assistant to general traffic manager of the Canadian Northern at Toronto, Ont., has been appointed general freight agent of the lines east of Port Arthur, with headquarters at Montreal, Que., and P. Mooney, general freight and passenger agent of the Halifax & Southwestern, at Halifax, N. S., has been

appointed assistant general freight agent of the Canadian Northern lines east of Port Arthur, with office at Toronto, Ont.

H. E. Webster is appointed coal freight agent of the Baltimore & Ohio, with headquarters at Cleveland, Ohio, vice C. R. Wright, resigned to engage in other business.

C. A. Schultz, assistant commercial freight agent of the Baltimore & Ohio at Brooklyn, N. Y., has been promoted to commercial freight agent, with same jurisdiction as heretofore.

Stuart A. Allen, who has been appointed general freight agent of the Baltimore & Ohio, with headquarters at New York, as has already been announced in these columns, began railway work as a traveling freight agent on the Cincinnati, Hamilton & Dayton. In 1904 he was appointed southern agent; the following year he was promoted to general southern freight agent, and two years later was appointed assistant general freight agent of the same road. In 1911 he became general agent of the Baltimore & Ohio-Cincinnati, Hamilton & Dayton lines at Cincinnati, Ohio, and on October 15, 1914, was appointed manager of the Continental Line and the Central States Dispatch fast freight connections of the Baltimore & Ohio. He was appointed general eastern freight agent of the Baltimore & Ohio, at New York, in October, 1916, which position he held at the time of his recent appointment as general freight agent of the same road, as above noted.

S. A. Allen

John H. Garrity, soliciting freight agent of the Buffalo, Rochester & Pittsburgh, at Pittsburgh, Pa., has been promoted to commercial freight agent in charge of a new agency at New Castle, Pa.

James B. Ford, whose appointment as general freight agent of the Southern Railway System with headquarters at Cincinnati, O., has already been announced in these columns, was born on July 18, 1880, at Raleigh, N. C., and was educated at North Carolina College. He began railway work in November, 1898, as a correspondence clerk in the division freight office of the Southern Railway at Raleigh. The following April he became stenographer and then was consecutively export clerk and secretary to the division freight agent at the same office; chief clerk to the commercial agent at Savannah, Ga.; stenographer-clerk and later rate clerk to the assistant freight traffic manager at Louisville, Ky. From January, 1905, to May, 1912, he served as chief clerk first to the assistant general freight agent, then to the assistant freight traffic manager at Louisville, and later to the vice-president of the Southern Railway and the Queen & Crescent Route at Cincinnati, Ohio. In May, 1912, he was appointed assistant general freight agent of the Queen & Crescent Route at the same place, which position he held at the time of his recent appointment as general freight agent of the Southern Railway System, as above noted.

J. B. Ford

G. C. Devol has been appointed assistant general freight agent of the Louisville & Nashville, with headquarters at Louisville, Ky., vice J. E. Crosland, resigned to accept service elsewhere.

E. C. Kitching, general agent of the Atchison, Topeka & Santa Fe, with office at Atchison, Kans., has been appointed division freight agent at Joplin, Mo., succeeding W. T. Treleaven, promoted. J. R. Piper has been appointed general agent at Atchison, succeeding E. C. Kitching.

R. W. Hunt, division passenger agent of the Southern Railway System, at Nashville, Tenn., has been transferred in the same capacity to Charleston, S. C., and W. H. Caffey, division passenger agent at Charleston, S. C., has been transferred in the same capacity to Knoxville, Tenn.

Brooks G. Brown, who has been appointed general freight agent of the Southern Railway System with headquarters at Washington, D. C., as has already been announced in these columns, was born on December 2, 1880, at Decatur, Ga., and was educated in private and high schools. He began railway work in 1899, as a stenographer with the South Eastern Freight Association at Atlanta, Ga., and later served in the same capacity in the office of the division freight agent of the Southern Railway at Atlanta until July, 1902, then in the general freight office at Washington, D. C. In April, 1903, he became secretary to the assistant general freight agent at Atlanta, and the following March was appointed rate clerk in the general freight office at the same place. On November 1, 1905, he was appointed traveling freight agent with headquarters at Spartanburg, S. C. From January, 1907, until September, 1913, he served in the general freight office at Atlanta, Ga., consecutively as executive clerk, assistant chief clerk, chief rate clerk and chief clerk. On September 1, 1913, he was appointed assistant general freight agent at Atlanta, Ga., which position he held at the time of his recent appointment as general freight agent of the same road as above noted.

### Engineering and Rolling Stock

G. H. Cook has been appointed division engineer of the Northern division of the Kansas City Southern, with headquarters at Pittsburg, Kan.

F. T. Huston, general car inspector of the Pennsylvania Lines West of Pittsburgh, at Ft. Wayne, Ind., has been appointed assistant engineer of motive power, with headquarters at Ft. Wayne.

E. H. Shipman, superintendent of the Lehigh & New England at South Bethlehem, Pa., has been appointed chief engineer, in charge of engineering, construction and valuation, with office at South Bethlehem.

F. K. Bennett, valuation engineer of the Minneapolis & St. Louis, at Minneapolis, Minn., has been appointed principal assistant engineer, vice J. H. Reinholdt, who has accepted service with another company.

J. C. Resch, superintendent of the Fort Worth division of the International & Great Northern at Mart, Tex., has been appointed chief engineer, with headquarters at Houston, Tex., vice O. H. Crittenden, deceased.

J. M. Weir, division engineer of the Kansas City Southern and the Arkansas Western, with office at Pittsburg, Kan., has been appointed chief engineer of these lines, with headquarters at Kansas City, Mo., succeeding C. E. Johnston, promoted.

M. H. Doughty has been appointed assistant to the chief engineer of the Delaware, Lackawanna & Western, with office at Hoboken, N. J., in charge of valuation, general drafting office and special duties as may be assigned. S. L. Rice, office engineer, having resigned, the position is abolished.

### Purchasing

E. Langham, purchasing agent of the Canadian Northern for lines west of Port Arthur, has had his authority extended over the system, with the title of general purchasing agent. His headquarters are at Toronto, Ont.

Robert T. Pace, having been relieved of his duties as purchasing agent of the Atlanta & West Point and the Western Railway

of Alabama, at his own request, in order to devote his entire time to his position as superintendent of the Atlanta Terminal Company, J. A. Best, until further notice, will act as purchasing agent, with headquarters at Augusta, Ga.

## OBITUARY

John G. Robinson, treasurer and assistant secretary of the Pittsburgh & Lake Erie, at Pittsburgh, Pa., died on March 3, at his home in Pittsburgh.

H. W. Sharp, formerly division superintendent of the Atchison, Topeka & Santa Fe, with headquarters at Newton, Kan., died on February 26, at La Jolla, Cal.

Eugene Castner Lewis, chairman of the board of directors of the Nashville, Chattanooga & St. Louis, whose death on February 13, at his home in Nashville, Tenn., was briefly noted in a previous issue, was born on June 22, 1845, at Cumberland Furnace, Tenn. He graduated from the Pennsylvania Military Academy in 1865, and later was engaged in the construction of a railroad in Arkansas. Shortly afterwards he became connected with the Louisville & Nashville, and helped survey the Owensboro and Memphis division of that road. He was also the builder of the Nashville terminals and the union station used jointly by the Nashville, Chattanooga & St. Louis and the Louisville & Nashville, and was one of the contractors that built the Cincinnati, New Orleans & Texas Pacific. In December, 1896, he was elected a director of the Nashville, Chattanooga & St. Louis, and since February, 1906, was chairman of the board of that road.

E. C. Lewis

Lansing S. Thorne, formerly for 17 years to May, 1911, vice-president and general manager of the Texas & Pacific, at Dallas, Tex., died on February 28 at his home in Dallas. He was born in 1849, at Greenville, N. Y., and after several years' service with the northern railroads, principally the Kansas Pacific, now a part of the Union Pacific, in train service and transportation department, he entered the service of the Texas & Pacific in 1874. With the exception of a short period engaged in construction work on western roads he served continuously with the Texas & Pacific from 1874, successively as brakeman, conductor, trainmaster, master of transportation, division superintendent and superintendent of transportation. From May, 1892, to May, 1894, he was general superintendent in charge of all departments, and then was vice-president and general manager until he retired in May, 1911.

Walter Katte, for 13 years, to 1899, chief engineer of the New York Central, and who for many years was actively engaged in railroad and bridge construction work in various parts of the United States, died suddenly on March 4, at his home in New York City, at the age of 87. He was born in London, England. He began railway work in 1850 as clerk and draftsman to the chief engineer of the Central of New Jersey, and at the outbreak of the Civil War he became colonel of an engineer regiment of the Union army. He was superintending engineer of erection of the Eads bridge at St. Louis. He served as chief engineer on the Third and Ninth avenue elevated railways, in New York City, from 1877 to 1880; during the next six years he constructed the West Shore Railroad, and when the railroad was taken over by the New York Central he became chief engineer of the New York Central also. During his administration the Central line in Park avenue, New York, was rebuilt on an elevated structure. He retired in 1899.

# Equipment and Supplies

## LOCOMOTIVES

THE OGDEN, LOGAN & IDAHO is in the market for 2 locomotives.

THE CAROLINA, CLINCHFIELD & OHIO is contemplating the purchase of a number of locomotives.

THE CUMBERLAND VALLEY has ordered 2 switching locomotives from the Pennsylvania's Altoona shops.

THE CUBA CANE SUGAR COMPANY has ordered 3 Consolidation locomotives from the Baldwin Locomotive Works.

THE MCKEESPORT CONNECTING has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE CANADIAN GOVERNMENT RAILWAYS are reported as having ordered 20 locomotives from the Canadian Locomotive Company.

THE ATLANTIC COAST LINE has ordered 10 Mikado, 7 Pacific and 5 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE PHILADELPHIA & READING has ordered 5 Mallet type locomotives from the Baldwin Locomotive Works, and has ordered 10 Pacific and 10 switching locomotives from its own shops.

THE BELT RAILWAY OF CHICAGO, reported in the *Railway Age Gazette* as inquiring for 5 Santa Fe type locomotives for hump-yard service, has ordered these engines from the Baldwin Locomotive Works.

THE UNION PACIFIC has ordered 16 Mallet type locomotives from the American Locomotive Company, and 31 Mikado, 5 Santa Fe, 7 Pacific and 25 six-wheel switching locomotives from the Baldwin Locomotive Works. The Mallet type locomotives ordered from the American Locomotive Company will have 26 and 41 by 32-in. cylinders, and a total weight in working order of 500,000 lb.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in last week's issue as being in the market for 20 Mikado and 10 Santa Fe type locomotives, has ordered these engines from the American Locomotive Company. The Mikado locomotives will have 28 by 30-in. cylinders, and a total weight in working order of 330,000 lb. The Santa Fe type locomotives will have 30 by 32-in. cylinders, and a total weight of 380,000 lb.

## FREIGHT CARS

THE CHICAGO & NORTH WESTERN is inquiring for 50 way cars.

THE CUMBERLAND VALLEY has ordered 7 cabin cars from the Pennsylvania's Altoona shops.

THE MIDVALE STEEL & ORDNANCE COMPANY has ordered 1,000 steel coal cars from the Cambria Steel Company.

THE FLORIDA EAST COAST, reported in last week's issue as being in the market for 200 flat cars, is also asking prices on 100 fruit cars.

THE PERE MARQUETTE has ordered 1,000 box cars from the Haskell & Barker Car Company and is reported as inquiring for 500 gondola cars.

THE GREAT NORTHERN has ordered 250 all-steel gondola cars from the Pressed Steel Car Company and has reduced an order for 1,000 box cars, given this company some time ago, to 750.

## PASSENGER CARS

THE NEW YORK CENTRAL is reported as contemplating the purchase of 25 baggage cars.

THE FRANKLIN COUNTY TRACTION COMPANY, John Longenfred, president, Centralia, Ill., is in the market for interurban equipment.

THE CUMBERLAND VALLEY has ordered 2 P70 coaches and 2

PB70 passenger and baggage cars from the Altoona shops of the Pennsylvania Railroad.

THE PHILADELPHIA & READING, reported in the *Railway Age Gazette* of February 16 as being in the market for 40 coaches and 10 combination passenger and baggage cars for suburban service, has ordered these cars from the Harlan & Hollingsworth corporation.

## IRON AND STEEL

THE PENNSYLVANIA RAILROAD has placed orders for 68,332 tons of steel rail for delivery in 1918, divided as follows: Bethlehem Steel Company, 19,133 tons; Cambria Steel Company, 15,033 tons; Lackawanna Steel Company, 4,100 tons, and United States Steel Corporation, 30,066 tons. This compares with a total of 205,000 tons ordered for delivery in 1917, the reason for the great reduction in the amount being the extremely high price. The latter will be $40.80, as compared with a price of $30.80 a ton, which is being paid for the rails ordered for delivery during the current year. Of the 1918 order 41,666 tons are for the Lines East and 26,666 tons for the Lines West.

## TRACK SPECIALTIES

THE BOSTON & ALBANY is said to be in the market for 10,000 kegs of spikes for delivery in the first quarter of 1918.

THE NEW YORK, NEW HAVEN & HARTFORD is reported to be inquiring for 10,000 kegs of spikes for delivery in the first quarter of 1918.

## SIGNALING

PENNSYLVANIA.—This road has ordered from the Union Switch & Signal Company material for 8 electro mechanical interlocking machines; also for one mechanical interlocking.

THE VIRGINIAN RAILWAY has bought from the General Railway Signal Company material for a mechanical interlocking, sixteen working levers and four spare spaces, at Coleman Place, Va.

THE ILLINOIS CENTRAL has bought from the General Railway Signal Company material for an electric interlocking at Rockford, Ky. The machine is model 2, unit lever type, 16 levers.

The WABASH RAILWAY is to extend its automatic block signaling in Indiana and has ordered from the Union Switch & Signal Company 34 signals, one arm, style S, ground signals, and two style T-2 signals.

GOVERNMENT-OWNED RAILROADS IN EUROPE.—There are 200,000 miles of railroads in the European countries at war, and about 125,000 of them are owned and operated by the governments of the countries in which they are situated.

A TON OF HAY.—The average passenger train earns about $1.40 per mile. The cars and locomotive weigh about 550 tons and they are projected through space from twenty to sixty miles an hour. That is to say, a 500-ton train of steel, plate glass, expensive woodwork, electric lights, etc., costing $200,000 or more, is projected twelve miles at a high speed for the price of a ton of hay. Where can one find any equivalent service for less money?

COMPLETION OF MURMAN RAILWAY IN RUSSIA.—According to an article published by the Russian chamber of commerce in Paris, the Murman Railway has been completed and the first trains have been run on the Murman coast. The length of the line from Petrograd to Alexandroosk is about 930 miles. The road follows the main line Petrograd-Vyatka-Perm to the station Zvanka, 75 miles east of Petrograd. There it turns north, passing Petrozavodsk on Lake Onega; Soroka, a small port on the western coast of the White sea; and Kem, another small White sea port, about 30 miles farther north. Turning to the northwest, the line reaches Kandalaksha, at the most westerly point of the White sea, and leaving on the west Lake Tmandra and the small Lake Kola, whence issues the Kola river, a branch of the Touloma, it arrives at Kola, which is situated at the confluence of the two rivers. The railroad then follows the western shore of the estuary to Alexandrovsk, in Katherine harbor.

# Supply Trade News

J. N. Hansen has been elected president of the Middletown Car Company, succeeding Arthur King, deceased.

Ernest L. Ransome, founder of the Ransome Concrete Machinery Company, died March 5 at his home in Plainfield, N. J., at the age of 73 years.

Peter Siems, president of the Siems-Carey Company, railroad contractors, St. Paul, Minn., died suddenly at Daytona, Fla., on March 3, at the age of 75 years.

Cass L. Kennicott has become associated with the Permutit Company of New York, and has been placed in charge of its Chicago office, 208 South La Salle street.

L. P. Alford has resigned as editor of the American Machinist to open an office as consulting engineer, and has been succeeded by John H. Van Deventer, managing editor.

After March 15 the Louisville branch of the H. W. Johns-Manville Company will be located in a new building at the corner of Fourth avenue and Guthrie street.

The Burdett Oxygen Company will complete the erection of its Salt Lake City, Utah, plant on March 1. The capacity of the Los Angeles, Calif., plant has also recently been increased 50 per cent.

C. E. White has recently been appointed Chicago branch manager of the U. S. Light & Heat Corporation, Niagara Falls, N. Y. Mr. White has for several years past been manager of the Detroit Battery Company of Detroit.

The Jerome-Edwards Metallic Packing Company, Chicago, feeling that the interests of its customers would be best conserved by a consolidation of its general offices and factory, on March 1, 1917, discontinued its offices in the Railway Exchange building. Its general offices are now located at the factory, 320-328 North May street, Chicago.

John F. Alden, formerly president of the Rochester Bridge Company, and more recently contracting manager of the American Bridge Company at Rochester, N. Y., died at his home in that city on February 27, at the age of 64. Mr. Alden built the upper suspension bridge at Niagara Falls, N. Y., and the bridge over the Columbia river at Pasco, Wash., together with many others throughout the United States.

The Independent Pneumatic Tool Company, Chicago, Ill., held its annual sales convention on February 28, and March 1. The first day's meeting was held at the company's factory at Aurora, Ill. Here the representatives were taken through the different mechanical departments, reviewing in detail the construction of Thor tools. On the following day a general sales meeting was held in the New Southern hotel, Chicago.

Chas. P. Williams, who has been appointed western representative at Chicago, for the railroad department of the West Disinfecting Company, graduated from the Minneapolis, Minn. high school in 1893 and immediately entered railway service with the Chicago, Milwaukee & St. Paul as an apprentice in the locomotive department at West Milwaukee, Wis. He advanced rapidly through all the mechanical departments at this plant and was then appointed assistant master mechanic of the Mexican Central, with headquarters at Guadalajara, Mex. Returning to the United States two years later he secured employment with the Minneapolis, St. Paul & Sault Ste. Marie as chief draftsman at Minneapolis, Minn., which position he held three years. He was then appointed assistant consulting engineer on the Canadian Pacific, with office at Montreal, Can., later being promoted to chief draftsman in the locomotive department of this same company. He entered the railway supply business as sales engineer and eastern agent of the Chicago Railway Equipment Company, with headquarters at New York City about eight years ago. He was special representative at Chicago for the National Lock Washer Company at the time his present appointment as noted above became effective.

### The National Railway Appliance Company

In the *Railway Age Gazette* of two weeks ago, announcement was made of the incorporation of the National Railway Appliance Company for the purpose of selling railway supplies, and to take over the entire railroad department business of the United States Metal & Manufacturing Company of New York. The new company has temporary offices at 165 Broadway, New York City, but it will move about April 1 to new offices on the eighteenth floor of the building at 50 East Forty-second street, New York.

B. A. Hegeman, Jr.

The company's officers are as follows: President, B. A. Hegeman, Jr.; first vice-president, Charles C. Castle; vice-president and treasurer, Harold A. Hegeman; assistant to president, F. C. Dunham; secretary and engineer, Edward D. Hillman. The company, as noted previously, has established a branch office in the McCormick building, Chicago, under the immediate management of Walter H. Evans, and a branch office in the Munsey building, Washington, D. C., under the management of J. Turner Martyn. Both managers were formerly connected with the railroad department of the United States Metal & Manufacturing Company.

C. C. Castle

Mr. B. A. Hegeman, Jr., president of the new company, was formerly in the railroad business. He started in 1878 with the Delaware, Lackawanna & Western, and was at one time general manager of the Lackawanna Live Stock Transportation Company. He left that position to go into the railway supply field as eastern sales agent of the American Car & Foundry Company, and in 1901 he was selected as the president of the United States Metal & Manufacturing Company, which position he has occupied for the past 16 years. Mr. Hegeman is also vice-president of the New York & North Shore Traction Company, vice-president of the Damascus Brake Beam Company of Cleveland, and president of the Anglo-American Varnish Company of Newark, N. J. In 1914 he was president of the Railway Supply Manufacturers' Association.

H. A. Hegeman

Charles C. Castle, first vice-president of the company, or "Charley" Castle, as he is better known, has been in the supply business for a long time. He was for many years vice-president of the Hildreth Varnish Company, and became associated with the United States Metal & Manufacturing Company in 1910 as manager of the railroad department. He is vice-president of the Anglo-American Varnish Company of Newark, and secretary and treasurer of the Genesco Corporation of Rochester, and was president of the American Electric Railway Manufacturers' Association in 1911.

F. C. Dunham

Harold A. Hegeman, vice-president and treasurer of the company, has also been connected with the United States Metal & Manufacturing Company for the past nine years as salesman, and is well known throughout the New England territory and New York state among steam and electric railway officials.

F. C. Dunham, assistant to the president, has been with the United States Metal & Manufacturing Company for the past 13 years as special sales agent, and during that period he has made a wide acquaintance among railroad officials through the promotion of the sales of the Dunham hopper door device.

E. D. Hillman

Edward D. Hillman, secretary and engineer, graduated from Lehigh University in 1898, with the degree of mechanical engineer. He was connected with several manufacturing concerns as engineer during the next four years, entering the employ of the New York Central in February, 1902. From 1902 to 1905 he was in the motive power and rolling stock department of the New York Central, going to the electrical department in December, 1905, where he remained until February, 1906, when he entered the employ of the United States Metal & Manufacturing Company as mechanical engineer.

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### The Chicago Railway Equipment Company

The annual report of the Chicago Railway Equipment Company calls attention to the fact that of the orders for cars placed during 1916 only 55,000 out of the total of 185,000 were ordered during the first six months of the year and 130,000 during the last six months. The company began the year 1917 with the largest volume of railway business which it has ever recorded on its books.

The disruption of the logical relation between railway purchases and general business prosperity has brought highly abnormal conditions in the business situation. The railway purchases have increased more slowly than general business and are now reaching higher and higher levels. It is pointed out that the business will almost certainly decline during the readjustment period which will follow the cessation of hostilities in Europe, but the saving factor in this situation is that it will no doubt bring about the readjustment of the purchasing power of the railroads, which will then take its accustomed place in the business of the country. During the past year the company declared no extra dividends. The report mentions numerous additions to the company's plant, some of which have already

been made; others are under consideration. The balance sheet for the year is as follows:

| Assets. | |
|---|---|
| Capital assets, including real estate, buildings, machinery, etc., patterns, goodwill and patents | $2,865,827.50 |
| Current assets, including inventories, investments at book values, accounts and bills receivable, and cash in banks, and on hand | 1,811,787.35 |
| Insurance premiums unexpired, etc | 1,053.36 |
| Total assets | $4,678,668.21 |
| **Liabilities.** | |
| Capital liabilities | $2,486,000.00 |
| Current liabilities | 198,927.15 |
| Reserves | 1,387,658.46 |
| Undivided profits | 606,082.60 |
| Total liabilities | $4,678,668.21 |

### International Trade Press, Inc.

Announcement has been made of the consolidation of the Electrical Review and Western Electrician with the International Trade Press, Inc., under the name of the latter company, which will hereafter issue the following publications: Electrical Review and Western Electrician, International Trade, Cement World, Electrical Blue Book, Metal Mining Catalog and the Index of Current (Technical) Literature.

C. A. Tupper is president and Lyman A. Sisley secretary-treasurer of the International Trade Press, Inc., which also represents large European publishing interests in this country, and will continue to maintain its headquarters in Chicago.

Charles V. Price, formerly president of the Electrical Review and Western Electrician, is vice-president of the consolidated company, and will assume charge of all the company's eastern business, with headquarters at 13 Park Row, New York.

### Lackawanna Steel Company

The annual report of E. A. S. Clarke, president of the Lackawanna Steel Company, to the stockholders says among other things:

"Shipments increased about 43½ per cent over those of 1915, more than doubling those of 1914, and exceeding by 215,310 tons —nearly 20 per cent—those of 1910, the largest previous record. The average price per gross ton of $41.59 received, therefore, is $10.84 more than in 1915, an increase of 35.25 per cent. Operations for the year, after the usual full allowances for depreciation and liberal charges against cost of special machinery and appliances, show a profit of $12,218,243.55, equivalent to 34.81 per cent on the $35,096,500 of your company's outstanding common stock.

"In September a dividend of 6 per cent on the outstanding common stock was declared, payable in four instalments of 1½ per cent each, on September 30 and December 30, 1916, and March 31 and June 30, 1917. In November an extraordinary dividend of 3 per cent on the outstanding common stock was declared, payable on December 30, 1916. The total of the above dividends actually paid in 1916 was $2,099,442.73.

"Orders on hand as of December 31, 1916, were 811,126 gross tons. Additional sales made since January 1 should ensure full operations for this year. Prices are very profitable, and, subject to the uncertainties of the situation should this country become engaged in war, the outlook for 1917 is more favorable than was that for 1916.

"The question of railroad transportation has become a very serious factor in respect to operations during 1917. The failure of the railroads to provide equipment necessary for adequate service, while due in some part to the agitation of their employees for increased wages and to the increased cost of all supplies that they use, was fundamentally due to the fact that they have been unable to secure increased rates for transportation and thus to secure such earnings as would provide a reasonable margin for improvements. The losses to the various producers and shippers of this country, due to failure to receive materials on time, lost output and increased labor charges, through enforced idleness because of congestion at terminals and railroad embargoes, probably greatly exceed the amount they would pay under rates which would enable the railroads to provide proper equipment and terminal facilities. It seems pertinent to suggest to the stockholders of this company that they cooperate in creating a sentiment favorable to such increases in rates of transportation for the railroads of this country as will permit them to supply an adequate service at all times. The people of the United States should appreciate that the railroads are not permitted to increase the prices for their service, no matter what the demand; that, in other words, their selling price is fixed, and many of the items of their cost of operation are determined by legislation; and that sufficient margin of earnings to ensure facilities for adequate service at all times cannot be had without increased rates."

| Assets. | | Liabilities. | |
|---|---|---|---|
| Cost of property | $73,485,956 | Capital stock | $35,096,500 |
| Investments in ore companies, etc. | 6,120,267 | Stock of subsidiary cos. | 6,388 |
| Cash in trust funds | 936,185 | Bonded debt | 26,081,500 |
| Inventories | 12,883,086 | Subsid. companies' bonds | 6,033,000 |
| Accounts receivable | 213,117 | Acc. pay. and pay-rolls | 5,752,074 |
| Customers' accounts | 6,713,711 | Bills payable | 616,174 |
| Notes receivable | 653,129 | Taxes and int. acc. | 790,705 |
| Cash | 3,689,881 | Dividends | 1,052,895 |
| Marketable securities | 493,375 | Reserves: | |
| Deferred charges | 879,527 | For dep. and repl. | 8,277,913 |
| | | For ext. of mines | 4,544,363 |
| | | For cont. and misc. op. | 668,553 |
| | $106,068,234 | Surplus | 17,148,169 |
| | | | $106,068,234 |

### Midvale Steel & Ordnance Company

The Midvale Steel & Ordnance Company owns all the stock of Worth Brothers Company, the Wilmington Steel Company, the Union Coal & Coke Company, the Remington Arms Company of Delaware and the Buena Vista Iron Company, and it controls the Cambria Steel Company and the Midvale Steel Company through stock ownership. The company's report for the year ended December 31, 1916, shows net profits, after all deductions, including special reserves, of $32,214,724, equal to 32.21 per cent on the $100,000,000 outstanding capital stock, or $16.10 per share. Total net income, including net earnings from operations and interest earned, etc., amounted to $37,606,017.

The consolidated balance sheet shows total current and working assets of $78,268,938, and total current liabilities of $17,603,304, leaving a net working balance of $60,665,634.

The surplus account showed a total of $33,656,610, from which there was deducted $15,000,000 for special depreciation charged off property and plant account, leaving a final profit and loss balance of $18,656,610.

The balance of liquid assets over current obligations was well in excess of the company's entire bonded and mortgage indebtedness, and about 60 per cent as large as the outstanding capital stock.

The balance sheet at the close of the year was as follows:

| Assets | | Liabilities | |
|---|---|---|---|
| Cash | $11,828,916 | Vouchers and. and unpaid payrolls | $5,490,406 |
| Customers' accounts | 14,531,893 | Deposits rec. on contracts | 7,902,650 |
| Advance payments | 6,839,215 | Accruals and misc. | 3,880,035 |
| Bills and loans rec. | 8,987,384 | Bills and loans pay. | 330,213 |
| Marketable securities | 1,375,821 | Min. int. in subsid. cos. | 4,126,851 |
| Inventories | 33,422,686 | Guaranteed stock: Cambria Iron Co. stock | 8,468,000 |
| Investments | 649,772 | Bonded and mtg. indebt. Midvale Steel & Ord. Co. | 45,736,000 |
| Property and plant | 135,708,933 | Subsidiary cos. | 9,141,000 |
| Deferred charges | 867,562 | Capital stock | 100,000,000 |
| Insurance fund | 633,251 | Dep. and mine exhaustion reserve | 8,054,069 |
| | | Con. and misc. res. | 3,059,599 |
| | | Surplus | 18,656,610 |
| Total | $214,845,433 | Total | $214,845,433 |

### Railway Steel-Spring Company

The annual report of the Railway Steel-Spring Company for the year ended December 30, 1916, shows gross earnings of $14,086,499, double those of last year, and net earnings of $1,765,807 available for the common stock, an increase of $1,347,579 over the preceding year. The net earnings are equal to 13.07 per cent on the $13,500,000 common stock, compared with 3.09 per cent earned on the same stock in 1915.

F. F. Fitzpatrick, president of the company, in his remarks to stockholders, says in part:

"Improved conditions existing during the latter part of 1915 continued throughout 1916, and the plants of your company have been operated to their fullest capacity all of the year, manufacturing its regular line of production, of which considerable volume has been sold for export, resulting in larger earnings, both gross and net, than in any other year since the incorporation of the company. To meet demands of this additional business,

necessary alterations to properties have been made and capacity for output of manufactured material has been increased. The favorable conditions in your company's business are still prevailing, and the outlook for 1917 continues promising.

"Your board of directors has deemed it advisable to reserve $1,000,000 from surplus earnings of the year for improvements, betterments and retirement of bonds. In addition, a charge of $1,000,000 for depreciation of machinery, plants and gas wells has been made and applied to operating expense. After making these charges and those necessary for improvements and betterments, payment of interest on the 5 per cent bonds secured by mortgages on the Latrobe plant and Inter-Ocean plant, and the necessary reservation for accrued interest on Inter-Ocean plant bonds, dividends of 7 per cent per annum on the preferred and a quarterly dividend of 1¼ per cent on the common stock, there has been carried to surplus account $1,597,056."

The balance sheet follows:

| Assets | | Liabilities | |
|---|---|---|---|
| Plants, etc. | $32,122,476 | Preferred stock | $13,500,000 |
| Inventories | 2,503,618 | Common stock | 13,500,000 |
| Securities | 1,548,943 | Bonds | 6,093,000 |
| Accounts receivable | 2,929,020 | Accounts payable | 181,332 |
| Other items | 53,453 | Reserve for plant improvements, betterments and retirement of bonds | 1,000,000 |
| Cash | 1,484,453 | Reserve for preferred stock dividend, interest on bonds, taxes, etc. | 397,691 |
| Total | $40,641,905 | Surplus | 5,969,942 |
| | | Total | $40,641,905 |

## TRADE PUBLICATIONS

FLEXIBLE GRINDERS. The Stow Manufacturing Company, Binghamton, N. Y., has issued bulletins 18 and 33 dealing respectively with its center grinder and its adjustable flexible grinders.

LIST OF STEEL AND OTHER PRODUCTS.—This is the title of a 52-page booklet recently issued by the Midvale Steel Company, the Cambria Steel Company and Worth Brothers Company. The book gives a complete list, alphabetically arranged, of the products made by these companies.

CLAY PIPES.—The International Clay Products Bureau, Kansas City, Mo., has issued a pamphlet containing 41 pages descriptive of salt glazed vitrified sewer pipe. It also contains a considerable amount of information of value in the design and construction of sewers, surface drains, culverts, etc. Numerous photographs illustrate the manufacture and use of the pipe in an interesting manner.

CONDENSER CLEANERS.—Bulletin 0-2, recently issued by the Lagonda Manufacturing Company, Springfield, Ohio, contains complete descriptions of air, steam and electric driven cleaners for cleaning the small tubes of condensers, heaters, evaporators and similar apparatus. Graphic illustrations show the existing relationship between the vacuum and steam consumption. The bulletin is illustrated with views of Lagonda condenser cleaners at work in different types of condensers, in power plants and ice plants. A special cleaner for evaporator tubes is also described.

TENDER TRUCKS.—A pedestal truck with side frames spring supported is described in Bulletin 113 issued in February by the Economy Devices Corporation. Two types are described, one for passenger and fast freight service, the other for switching and slow freight service. Both have side frames supported by triple helical springs resting on box yokes enclosing standard M. C. B. journal boxes. By the use of this box yoke, hinged to the side frame, the necessity for special journal boxes has been obviated and pedestal wear eliminated.. Side frames are of cast steel, U-section throughout.

VACUUM PUMPS.—The Ingersoll-Rand Company has recently issued two new catalogues on dry vacuum pumps, Form No. 3037 covering the straight line type, and Form 3038 the duplex type. Both machines are equipped with "Ingersoll-Rogler" valves, are capable of maintaining a high vacuum and will handle discharge pressures of several pounds. The maximum degree of vacuum possible varies with the different machines to within .6 in. of the barometer. Both steam and power driven pumps in a large range of sizes and capacities are listed. The catalogues are profusely illustrated in colors to show the machines in whole and in section.

# Railway Construction

BARTON COUNTY & SANTA FE.—A charter has been granted this company for the construction of a railroad from Holyrood, Kan., through Barton and Rice counties to Galatia, about 32 miles. Contracts for this undertaking are ready for letting.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded contracts for the construction of an extension from a point on its Blackfoot branch near Clearwater, Mont., to Lincoln, a distance of about 33 miles. With this extension built, half of the connecting link between Missoula, Mont., and Great Falls will be completed.

ENID & NORTHWESTERN.—This company has organized with a capitalization of $400,000 for the construction of a road from Fairmount, Okla., to Bliss, about 35 miles; thence to Tonkawa, about 10 miles. The plans have not gone beyond the incorporation point as much depends upon the development of the oil fields through which the line will run, and from which the road will derive its principal revenue.

GULF, MOBILE & NORTHERN.—A contract is reported let to the Oliver-Hill Construction Company, Maryville, Tenn., for work on a 10-mile section of the extension to be built from Middleton, Tenn., to Jackson, about 34 miles. W. A. Wogan, Denver, Colo., is reported to have a contract for work on a 20-mile section.

KNOXVILLE INTERURBAN.—This company was organized in Tennessee with $10,000 capital and proposes to build an interurban line from Knoxville south to Maryville about 13 miles; also to build city lines in Maryville. The incorporators include N. B. Morrell and J. W. Hudson, of Knoxville, E. R. Oates, J. H. Knox and M. T. Devault. R. H. Hanna is the representative of the company at Maryville.

MERIDIAN & BIGBEE RIVER.—This company has started work in Meridian, Miss., on a line to be built from that place to a point not yet determined upon. The line is to have a 1 per cent gradient and 4 deg. curves; it is being built to carry forest products. S. A. Neville, vice-president of the Meridian & Memphis, at Meridian, is president of the new company and J. M. T. Hamilton is chief engineer.

METROPOLIS BELT & TERMINAL RAILWAY.—Incorporated in Illinois with $300,000 to build a belt line around the city of Metropolis, Ill., and to provide direct connection with the new railroad bridge over the Ohio river, which is nearing completion. The incorporators include T. F. McCartney, W. P. Baynes, S. F. Chase, Metropolis, Ill., and R. M. Greenlaw, St. Louis, Mo.

OSAGE COUNTY & SANTA FE.—Articles of incorporation have been filed and a charter granted this company for the construction of a new steam line running from a point two miles south of Fairfax, Okla., through Osage county to Owens, a distance of about 62 miles. There will be five steel bridges, and approximately 20 pile trestles. The right of way runs through an unusually rough country, and it is expected that the grading will be heavy. The maximum curve is 3 deg., and the maximum grade 0.7 per cent. Contracts for this undertaking are now ready to be let.

TEXAS STATE RAILROAD.—This company, operating a line from Rusk, Tex., to Palestine, 33 miles, intends shortly to construct a 100-mile extension. For this purpose the state legislature has voted a bond issue of $600,000, and the governor has signified his intention of making the bill a law. It is then intended either to sell or lease the road to private parties.

WAYNE-HARDIN.—The Tennessee Valley Iron & Railroad Company, Pittsburgh, Pa., is reported as having let a contract to the Oliver Contracting & Engineering Co., Maryville, Tenn., for work on this line from Collinwood, Tenn., to Savannah. The company was organized to build from Waynesboro, Tenn., south to Collinwood, where connection was to be made with the Tennessee Western, thence west to Savannah, in all, about 45 miles. E. H. Steinman, president, Collinwood. (September 29, p. 571.)

## RAILWAY STRUCTURES

BUFFALO, N. Y.—Bids for the elimination of the grade crossing of the Erie Railroad at Louisiana street, Buffalo, will be received at the office of the Grade Crossing Commission until March 13, 1917.

EAST BUFFALO, N. Y.—The improvements to be carried out by the Lehigh Valley include a new, reinforced-concrete enginehouse at East Buffalo, a 15-stall addition to the present enginehouse at Tifft Farm, together with new machine shops, powerhouse, oil houses, etc. This work is to be started at once, and contracts for their construction have been let to the Westinghouse-Church-Kerr Company. The East Buffalo enginehouse will contain 22 stalls. A 100-ft. electrically operated turntable, with air auxiliary for emergency, and a 250-ft. double-track water and ash pit, constructed of steel and concrete, are included, and a gantry crane will be used to remove ashes. The new structure will abut the present enginehouse. The latter, in part, will be converted into an annex containing blacksmith, machine and boiler shops, equipped with a complete assortment of necessary tools. The present boiler plant will be trebled in size. Considerable track changes, necessitated by the erection of the new enginehouse, will be made in the present yards at East Buffalo. The addition at Tifft Farm will bring the capacity of the enginehouse there up to 26 stalls. In the addition the stalls will have 102½ ft. clearance to accommodate the big locomotives. The plans for the Tifft Farm structure call for a modern turntable, drop-pits and a double track water and ash pit. Supplementing the reconstructed enginehouse will be up-to-date oil houses and a powerhouse constructed of brick, steel and concrete. Provision will be made also for offices and locker and tool rooms. The powerhouse will contain machine and blacksmith shops, and a storeroom. The existing coaling facilities will be retained for the time being. Later, however, they will be supplemented by a modern mechanical plant.

EAST SALAMANCA, N. Y.—The Buffalo, Rochester & Pittsburgh expects to build a powerhouse, machine shop and other facilties at East Salamanca this year at a cost of about $200,000. Plans for these improvements, however, have not yet been completed.

GALVESTON, TEX.—The Southern Pacific has approved plans for the construction of a series of five concrete piers, similar in design and construction to Pier B in the west end of the city. The estimated cost of the structures is between $4,000,000 and $5,000,000, based on the present prices for steel and other necessary materials. Provision has also been made for a single concrete and steel pier to be used exclusively for foreign trade.

HELENA, Ark.—The Yazoo & Mississippi Valley in connection with the Missouri & North Arkansas has opened bids for the erection of a combination passenger and freight station. The structure will be of concrete and brick with slate roof, and two stories high. It will be 41 ft. wide, the passenger part of it 100 ft. long and the freight extension 280 ft. long. The estimated cost of the undertaking is $50,000.

KINGSPORT, Tenn.—The Carolina, Clinchfield & Ohio is planning to carry out work this spring on a brick and concrete passenger station at Kingsport. The proposed structure is to be one story high, 40 ft. wide and 160 ft. long and will cost about $50,000. (Feb. 16, p. 296.)

MACON, GA.—Plans are nearing completion, and bids will probably be asked for about March 15, to build freight terminals for the Central of Georgia in Macon. The work will include the construction of a two-story office building about 40 ft. by 130 ft. of brick and concrete construction, an inbound freighthouse about 50 ft. by 600 ft. of brick and concrete construction, and an outbound freight shed of concrete, about 30 ft. by 800 ft.

PRINCETON, N. J.—The Pennsylvania Railroad will re-locate the passenger station and will also enlarge the yards at Princeton.

TULSA, OKLA.—The Midland Valley has awarded the Railroad Water & Coal Handling Company, Chicago, Ill., a contract for the installation of a Miller-type intermittent water-softening plant, to be located at its new terminal at Lefeber, Okla., near Tulsa. The capacity of the plant will be 10,000 gal. per hour.

## Railway Financial News

ALABAMA & MISSISSIPPI.—This company is to take over the Pascagoula Northern. The Alabama & Mississippi runs from Vinegar Bend, Ala., to Pascagoula, Miss., 76 miles.

CHICAGO GREAT WESTERN.—A dividend of one per cent has been declared on the preferred stock. A dividend of one per cent was paid on the preferred in October.

CHICAGO, ROCK ISLAND & PACIFIC.—The Commercial & Financial Chronicle says that while no decision has been reached as to whether the reorganization should be completed under the charter of the existing company or otherwise, legislation is being sought in Iowa to authorize the present corporation to issue $30,000,000 preferred stock.

DENVER & RIO GRANDE.—It is said that the semi-annual interest of 3½ per cent on the $10,000,000 adjustment income bonds, due April 1, is to be paid on that date, notwithstanding the suit which has been brought against the company as guarantor of the Western Pacific bonds which have been defaulted both as to principal and interest.

ERIE.—It is understood that this company will sell in the near future $15,000,000 notes. The proceeds will be used to pay off $9,280,000 three-year collateral notes of 1914 and for other capital purposes.

EVANSVILLE & INDIANAPOLIS.—William C. Wilson & Co., New York, are offering $675,000 six per cent receiver's certificates, due January 1, 1920, at par.

KANSAS CITY NORTHWESTERN.—This road has been put in the hands of Louis S. Cass, of Kansas City, as receiver.

NEW ORLEANS & NORTHEASTERN.—Stockholders are to vote on the question of authorizing a refunding and improvement mortgage to be dated March 1, 1917, to secure an issue of $16,000,000 bonds bearing interest not to exceed 6 per cent.

NEW ORLEANS, TEXAS & MEXICO.—An initial payment of 1½ per cent has been declared on the $15,180,000 non-cumulative income mortgage bonds, payable April 1, 1917.

NEW YORK CENTRAL.—The New York Public Service Commission, Second district, has given the New York Central permission to buy the Fulton Chain Railway and the Raquette Lake Railway. The Fulton Chain Railway runs from Fulton Chain, N. Y., to Old Forge, two miles, and the Raquette Lake Railway from Carter, N. Y., to Raquette Lake, 18 miles.

NEW YORK, NEW HAVEN & HARTFORD.—Judge Mayer in the U. S. District Court has postponed from July 1, 1917, to April 1, 1918, the date before which the New Haven and New England Navigation Company must sell the $1,500,000 bonds and the 20,000 shares of stock of the Eastern Steamship Corporation.

PASCAGOULA NORTHERN.—See Alabama & Mississippi.

PENNSYLVANIA-DETROIT.—See Pennsylvania Railroad.

PENNSYLVANIA RAILROAD.—See editorial comments on this company's annual report in this issue.

The Pennsylvania-Detroit Railroad has filed papers of incorporation with the Michigan secretary of state. This is the subsidiary of the Pennsylvania which is to build a branch line into Detroit.

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LONDON ELECTRICAL SERVICES.—For the new electrical services to Watford, which will be a continuation of the "Bakerloo" services from Elephant and Castle to Willesden, the London Electric Railways Company will, for the present, provide the rolling stock. In order to meet the difference of, we believe, 13 in. between the height of the London & North Western and the "Bakerloo" platforms, the gangways of the electric cars are to be raised 6½ in., so that on alighting passengers on the London & North Western line will step up 6½ in. and on the tubes will step down 6½ in. The level of the floor will not be interfered with, but at the entrance to the gangway the difference of 6½ in. in the height will be met by a ramp.—*Engineering, London.*

[ADVERTISEMENT.]

# ANNUAL REPORTS

## THE PENNSYLVANIA RAILROAD COMPANY

GENERAL OFFICE, BROAD STREET STATION, PHILADELPHIA, PA.,
February 28th, 1917.

The Board of Directors herewith submit to the Stockholders of The Pennsylvania Railroad Company a synopsis of their Annual Report for the year 1916:—

### CONDENSED INCOME STATEMENT.

| | | |
|---|---|---|
| Railway operating revenues | | $230,278,533.33 |
| Railway operating expenses | | 166,164,581.74 |
| Net revenue from railway operations | | $64,113,951.59 |
| Railway tax accruals | $9,022,399.69 | |
| Uncollectible railway revenues | 35,540.58 | 9,057,940.27 |
| Railway operating income | | $55,056,011.32 |
| Non-operating income: | | |
| Income from securities, accounts, and sinking and other reserve funds | $20,479,070.37 | |
| Rent income, etc | 2,685,792.64 | 23,164,863.01 |
| Gross income | | $78,220,874.33 |
| Deductions from gross income | | 25,944,370.21 |
| Net income | | $52,276,504.12 |
| Disposition of net income: | | |
| Income applied to sinking and other reserve funds | $2,138,959.19 | |
| Dividend of six per cent | 29,952,252.00 | |
| Income appropriated for road and equipment, improvements, etc | 12,928,711.26 | $45,019,922.45 |
| Balance transferred to Profit and Loss | | $7,256,581.67 |

### CONDENSED GENERAL BALANCE SHEET.

DECEMBER 31ST, 1916.

ASSETS.

| | | |
|---|---|---|
| Investments: | | |
| Investment in road and equipment | | $524,285,944.43 |
| Improvements on leased railway property since June 30th, 1907 | | 19,972,469.08 |
| Sinking funds | | 2,219,868.84 |
| Miscellaneous physical property | | 2,132,365.19 |
| Securities owned and advances to affiliated and other companies | | 344,074,521.41 |
| Current assets | | 130,902,840.97 |
| Deferred assets, including insurance and other funds | | 31,659,362.80 |
| Unadjusted debits | | 3,579,568.25 |
| | | $1,058,826,940.97 |

LIABILITIES.

| | |
|---|---|
| Capital Stock | $499,204,700.00 |
| Premium realized on Capital Stock from January 1st, 1909 | 7,254,247.63 |
| Bonded debt and other obligations | 250,356,844.61 |
| Current liabilities | 86,463,769.38 |
| Deferred liabilities | 446,643.09 |
| Unadjusted credits, including accrued taxes and depreciation reserves | 41,425,397.62 |
| Corporate surplus: | |
| Additions to property through income and surplus since June 30, 1907 | 99,681,517.29 |
| Sinking fund reserves, miscellaneous fund reserves, etc | 40,479,613.80 |
| Profit and Loss | 33,514,207.55 |
| | $1,058,826,940.97 |

### GENERAL REMARKS.

#### REVENUES.

Your Company carried an unprecedented volume of traffic on its lines, resulting from a continuance of the European War, and from the further expansion of general business throughout the country, which produced an increase of 17 per cent. in the total Operating Revenues compared with 1915. The Freight Revenue increased 17 per cent.; Passenger Revenues increased 16 per cent.; and Express Revenue increased 25 per cent. Incidental Revenue increased 34 per cent., due in a large measure to demurrage charges paid for the unreasonable detention of cars by consignees and shippers, but the Company's freight revenues would have been greater had the cars not been so delayed, and the Hire of Equipment payments would have been lower.

#### EXPENSES.

The total Operating Expenses increased 16 per cent. compared with 1915; Maintenance of Way and Structure Expenses increasing 14 per cent.; Maintenance of Equipment 19 per cent. and Transportation 17 per cent. To the same underlying causes can be attributed the increase in all of these expenses, namely, greater traffic and substantial increases in the cost of material, supplies and labor.

#### TAXES.

Special attention is directed to the Taxes, which increased 19 per cent., due principally to an increase in Federal Income Tax from 1 per cent. to 2 per cent., and to larger revenues. This item of expense is one over which the management has no control and the increase [129 per cent. in the last ten years] shows no sign of abatement. Taxes now require 14 cents out of every dollar of net operating revenue, compared with 8 cents ten years ago. It is significant that over two-thirds of the increase in Operating Revenues was absorbed by increased expenses and taxes. The time seems close when taxpayers must for their own protection demand that all governmental expenditures be fully reviewed before being authorized, so that reasonable limit may be placed on the constantly increasing Federal, State and Municipal expenditures for non-productive projects.

#### FINAL RESULTS.

The Net Income for 1916 amounted to $52,276,504.12, an increase of $9,851,181.80 compared with the previous year. Against this were charged the appropriations to the Sinking and Other Reserve Funds, Cash Dividends aggregating six per cent. on your Capital Stock and Road and Equipment expenditures on lines owned and leased, leaving a balance of $7,256,581.67, which was transferred to the credit of Profit and Loss Account.

#### RATES.

The appeal by your Company from the order of the Public Service Commission of Pennsylvania, reducing certain anthracite coal rates, is still pending in the Common Pleas Court of Dauphin County; and the proposed advance in intrastate passenger rates in the State of New Jersey, which is a part of the general plan suggested in 1914 by the Interstate Commerce Commission as a means for procuring additional revenue, is still suspended by the Public Utilities Commission of that State.

The necessity for higher rates is daily becoming more evident, for while the results for the first eight months of 1916 showed a satisfactory increase, yet since then the net returns have shown a marked reduction due to higher costs. Your Company, to avoid congestion and handle the traffic economically and promptly, has expended, and is now expending, large amounts of capital upon which a return must be earned; it has made adjustments in employes' wages to retain them in the service and enable them to meet the higher living costs; and is paying extraordinary increases in the prices of materials and supplies, and in taxes; in addition to which it is burdened with conflicting and wasteful regulation and laws. These increased costs have made heavy inroads into your profits during the past few months, and it is expected that their effect will be even more acute in 1917. With such a widespread and pressing demand for larger terminals, greater facilities and more equipment, it is essential (if they are to be provided) to grant the railroads the higher rates necessary to place them in a position to meet such rising costs, and give them the earning basis to attract new capital for the additional transportation facilities and service so urgently required. The lack of sufficient surplus for many years past has prevented the railroads from providing such additions and betterments in advance of traffic demands, and while labor and material costs were reasonable. An illuminating feature of the railroad situation appears in the Interstate Commerce Commission report of December 1st, 1916, showing that for practically all the railroads in the country the average freight revenue per ton mile has fallen from 8.9 mills in 1891 to 7.3 mills in 1915, a decrease of over 17 per cent., notwithstanding the greatly increased costs and higher standards entering into the transportation service. Another important statement in that report showed the return on the Investment in Road and Equipment for the year ending June 30th, 1916, to be slightly in excess of 6 per cent. That return is a great improvement compared with preceding years, but it was earned in a year when the country was enjoying the greatest prosperity in its history, and when so many of the industries, which are free to fix their prices to meet market conditions, were earning many times six per cent. The latter is a healthy condition, beneficial to the country at large, but it is also one in which the railroads, which must pay the greatly increased prices, wages and taxes, should be allowed to participate through higher rates upon the commodity they sell, viz. transportation. Under the existing international complications, and exceptional industrial activity, there should be no delay in placing the railroads in the strongest financial and physical condition.

#### RETURN ON INVESTMENT IN ROAD AND EQUIPMENT.

While your Net Income for the year, after deducting the sinking and other reserve fund charges, was equivalent to 10 per cent. upon the outstanding Capital Stock, the return earned on the total investment in Road and Equipment provided for public use was only 5.4 per cent. on the Pennsylvania Railroad and lines directly operated, and but 5.8 per cent. on the System East and West of Pittsburgh. Your Company maintained its dividend and earned a substantial surplus, but if it had not heretofore consistently pursued the policy of investing its surplus above reasonable dividends in the betterment of your railroads and equipment instead of providing therefor through the issue of additional bonds and stock, the present dividends could not be maintained under the existing traffic rates.

#### TRAFFIC.

Improved efficiency characterized the operation during the year in both freight and passenger traffic. The number of tons increased 16 per cent. and the tonnage mileage increased 18 per cent., but largely by heavier car loading the additional tonnage and mileage required an increase of only 8 per cent. in train mileage. It is interesting to point out that the average train load has been increased in the last ten years from 553 tons to 870 tons, or 57 per cent. The average revenue per freight train mile increased 8 per cent., but heavier expenses and taxes absorbed the increase and caused a slight decrease in net revenue per freight train mile. The average ton mile revenue received was slightly less than in 1915, being only .603 of a cent per ton mile, which is less than 50 per cent. of the average freight rates paid on either the German or French Roads in normal years, and they have the additional advantage of much lower wages, taxes, and other operating costs.

The number of passengers increased 16 per cent., passenger mileage 15 per cent., passengers per car 13 per cent., while passenger train mileage increased only 5 per cent.

#### THE EIGHT HOUR LAW.

The employes in the train service on most of the railroads in the United States submitted demands through their labor organizations for an eight hour basic day at the existing rates of pay, and time and one-half payments for all overtime in freight and yard service. Although many of the men in the train service do not work eight hours per day, this reduction in the time constituting a basic work day meant in effect an unjustifiable increase of pay for most of these employes. Conferences extending over several months were held between the representatives of the railroads and the trainmen's organizations, with the hope that by arbitration, in which the public would have been represented, some reasonable solution could be reached, for the railroads felt that, as compared with other employment in and out of the railroad service, these men were liberally treated, if not, in some cases, overpaid. The trainmen would not consent to arbitration, or other investigation, and orders for a strike were given in case the railroads refused to accede to their demands. The transportation service of the Country was threatened with stoppage at a time when industries in general had reached their greatest production, and the food supply and other necessaries of life, especially in the larger cities, were absolutely dependent on the continued operation of the steam railroad systems. It is questionable whether many of the men, especially those in your service who have faithfully served the Company for many years, would finally have deserted

their positions, yet the untold suffering and disruption of business that would have resulted from the execution of this threat, made by the trainmen through their leaders, were so evident that the "Eight Hour Law" was enacted by Congress in the brief period of a few days. The threatened strike was averted, but in the hasty proceedings leading to its enactment, the principle of arbitration, as the paramount and equitable method of settling labor disputes, was sacrificed, not in the public interest, nor for the benefit of a majority of railroad employes, but for a group of men constituting only a small percentage of the total number, and no action was taken by Congress to prevent or settle future strikes.

This law provides that beginning January 1, 1917, eight hours shall in contracts for labor and service be deemed a day's work, and the measure or standard of a day's work, for the purpose of reckoning compensation for employes engaged in the operation of interstate trains, and provides a Commission of three to observe the effects of the law for a period of from six to nine months, and report its findings to the President and Congress; but it also requires that, pending the report of the Commission and for thirty days thereafter, the existing standard day's wage shall be paid for an eight hour day, and for overtime the employes shall be paid not less than the pro rata rate for such standard eight hour day. While wages are increased by its provisions, there is apparently nothing to prevent an employe working more or less than eight hours per day. Your management being unable to satisfactorily interpret the provisions of the law, and having grave doubts as to its constitutionality, has instituted proceedings to test its validity in the Federal Courts.

The Federal and State laws and the public welfare require Railroad Companies to render a continuous and adequate transportation service, and it should be equally obligatory that no disruption of that service from any cause be tolerated. Therefore, in the public interest, which is paramount, future strikes or lockouts should be prevented until the differences between the railroads and their employes are first submitted to independent and impartial review and arbitration.

### Federal Transportation Inquiry.

A Joint Congressional Committee has been appointed, upon the recommendation of the President, to investigate the efficiency of the existing system of public regulation in protecting the rights of shippers and carriers, and in promoting the public interest.

The Railroads will assist this investigation, and have already submitted evidence that the present system of Federal and State regulation is inconsistent, confusing and wasteful. They have, therefore, requested consideration of a program, which, in substance, covers—

1. Federal supervision of the issue of railroad securities.
2. Federal incorporation of interstate railroads;
3. Exclusive Federal regulation of rates;
4. A regional and functional division of the work of the Interstate Commerce Commission;
5. Restricting rate suspensions by the Commission to not more than sixty days;
6. Giving the Interstate Commerce Commission the power to prescribe minimum as well as maximum rates.

The aim of constructive legislation should be to allow the railroads to conduct the transportation service under such conditions as will preserve their credit so that they can at all times efficiently and economically carry the commerce of the Country, and be its most available and effective instruments for National defense. Under the existing conflicting systems of public regulation by the Federal and State Governments, the railroads have not been allowed to earn sufficient profits to place them in that position, and, therefore, there has been a serious decline in constructing new mileage, new equipment and sufficient facilities to accomodate the shippers and the public. With the increased traffic in the past eighteen months this condition was somewhat improved, but the needs of the situation have not yet been satisfactorily met. The common carriers as a whole for many years have had to depend for new capital on the increase of their debt and mortgage obligations, rather than by the sale of Capital Stock, so that it is evident their credit is not yet securely founded. Therefore a serious responsibility rests upon this Congressional Committee to make a thorough, prompt and impartial investigation of the entire transportation problem; and recommend legislation that will insure sound credit for the railroads; reasonable rates and adequate service to the public; and replace conflicting and wasteful regulation with unified, responsible, regulation by the Federal Government, under which the railroads will be permitted to earn a fair return on the capital already invested in the public transportation service, and sufficient to attract the additional capital requisite to regularly enlarge and improve their terminals, tracks, equipment and other facilities in advance of actual commercial requirements.

### Financial.

On December 31st, 1916, the Company had 90,388 stockholders, whose average holdings were 110 shares. All of the stock is held in the United States except less than 3 per cent.

The Capital Stock outstanding was increased by $1000 through the sale of that amount of stock held by the Company.

The funded debt, equipment trust obligations, mortgages and ground rents payable show a net decrease of over $5,460,000. This is due chiefly to redemption of bonds through the various Sinking Funds; to the conversion of Consolidated Mortgage Sterling Bonds into Dollar Bonds; and to the maturity and payment of over $4,698,000 of equipment trust obligations. The increase in current liabilities (which is also reflected in the Company's assets), is due chiefly to the issue of $20,000,000 of short term notes, which mature in April, 1917.

The stockholders, in pursuance of notice already given, will be asked to approve of an increase in the authorized indebtedness of the Company to the extent of $75,000,000. If approved, the Board of Directors will thereafter be enabled through the issue of bonds secured by the General Mortgage, or by such other form of security as at the time may be most advantageous to the Company, or through the issue and sale of previously authorized Capital Stock, to procure the funds necessary to meet maturing obligations, including $20,000,000 of 3⅞ per cent. Nine Month Notes issued for capital purposes during the year, which will mature in April, 1917, and to provide the necessary capital expenditures on your constantly expanding property.

It has been deemed advisable to acquire the property and franchises of the Harrisburg, Portsmouth, Mt. Joy & Lancaster Railroad Company, the railroad of which company extends from Lancaster to Harrisburg, and forms an integral part of the main line of your Company. This line is operated under a nine hundred and ninety-nine year lease. Your Company now owns over 90 per cent. of the Capital Stock, and as the necessity for maintaining it as a separate corporation no longer exists, an agreement providing for its acquisition will, in accordance with notice given to the stockholders, be submitted for approval at the annual meeting.

Your Company, as the majority stockholder in the Long Island Railroad Company, and with the view of obtaining the shares which it does not now hold, amounting at par to $5,202,100., has offered a like amount of Five Per Cent. Debenture Bonds of the Long Island Railroad Company, which, if the plan be consummated, your Company is to receive in part payment for advances to that Company. If a satisfactory number of the minority shares of that Company will co-operate to make such a plan effective, your Company is also willing to accept additional Common Stock of the Long Island Railroad Company in settlement of the balance of its indebtedness, so that the fixed charges of the Long Island Railroad Company may be materially reduced and its credit strengthened to finance its future capital requirements.

### Road and Equipment.

The report shows that the Company has continued its large program of expenditures for the enlargement and improvement of its railroad and the purchase of additional equipment, relying upon the public to see that higher rates are paid to justify a continuance of such a policy. Nearly $25,000,000. was expended for Road and Equipment on the Pennsylvania Railroad and Lines directly operated by it, of which $12,928,711 was charged against the Surplus Income for the year. Several pages of the report are devoted to a description of the improvements to the railroad, stations, yards, and track extensions all over the System. The equipment purchased during the year consisted of 264 locomotives, 403 passenger cars and 6,252 freight cars.

### Pension Department.

Your Company has 3,272 pensioners on its rolls, and the pensions paid during the year amounted to $1,042,080., an increase of 187 pensioners and $76,274. in the payments made.

### Federal Valuation.

The valuation of your lines, under the direction of the Valuation Division of the Interstate Commerce Commission, in which your Company is constantly co-operating, continued throughout the entire year. The field work, preparatory to the inventory of the property, has been practically completed for the Northern Central Railway, which is leased by your Company, and for various leased lines in the State of New Jersey. Considerable work of this character was also done during the year on the Western New York and Pennsylvania Railway, which is also leased by your Company.

The cost to your Company in carrying out this work during 1916 was $169,926.52 and the total to December 31st, 1916, was $314,545.17. The expenditures of this character by the Lines East of Pittsburgh amounted to $293,764.08 for the year and aggregated $586,578.42 to December 31st, 1916, and for the entire System East and West of Pittsburgh $623,346.59 for the year and $1,099,040.07 to December 31st, 1916.

SAMUEL REA,
*President.*

STOCKHOLDERS MAY OBTAIN COPIES OF THE ANNUAL REPORT COMPLETE, BY APPLYING TO OR ADDRESSING
LEWIS NEILSON, SECRETARY,
BROAD STREET STATION, PHILADELPHIA, PA.

## BUFFALO, ROCHESTER & PITTSBURGH RAILWAY COMPANY THIRTY-SECOND REPORT

The Directors of the Buffalo, Rochester and Pittsburgh Railway Company submit to the Stockholders the following report for the six months ending December 31, 1916:

### ROAD OPERATED.

| | Dec. 31, 1916, Miles. | June 30, 1916, Miles. | Increase. Miles. |
|---|---|---|---|
| Owned | 367.06 | 367.06 | |
| Leased | 89.90 | 89.90 | |
| Trackage rights | 129.52 | 129.52 | |
| Total length of road operated | 586.48 | 586.48 | |
| Second track | 208.33 | 208.33 | |
| Sidings | 382.50 | 378.14 | 4.36 |
| Total miles of tracks, all steel rail | 1,177.31 | 1,172.95 | 4.36 |

There was no change in the mileage of road operated. The tracks were increased by 4.36 miles of new sidings.

### INCOME.

| Operating Income: | 6 Months Dec. 31, 1916. | 6 Months Dec. 31, 1915. | Increase or Decrease. |
|---|---|---|---|
| Revenues | $6,768,748.72 | $5,978,012.52 | $790,736.20 |
| Expenses | 5,025,808.22 | 4,284,804.43 | 741,003.79 |
| Net revenue | $1,742,940.50 | $1,693,208.09 | $49,732.41 |
| Tax accruals | 132,000.00 | 120,000.00 | 12,000.00 |
| Uncollectible revenues | 1,354.26 | 38.27 | 1,315.99 |
| | $133,354.26 | $120,038.27 | $13,315.99 |
| Total operating income | $1,609,586.24 | $1,573,169.82 | $36,416.42 |
| Non-operating income | 525,413.56 | 416,237.82 | 109,175.74 |
| Gross income | $2,134,999.80 | $1,989,407.64 | $145,592.16 |
| Reductions for interest, rentals, etc. | 1,051,969.27 | 1,071,779.14 | —19,809.87 |
| Net income | $1,083,030.53 | $917,628.50 | $165,402.03 |

| Appropriations: | | | |
|---|---|---|---|
| Pension and Fire Insurance Funds | $9,177.01 | | $9,177.01 |
| Special appropriations | 209,997.81 | 221,910.91 | —11,913.10 |
| Total appropriations | $219,174.82 | $221,910.91 | —$2,736.09 |
| Surplus available for dividends | $863,855.71 | $695,717.59 | $168,138.12 |
| Return on capital stock for six months | 5.24% | 4.22% | 1.02% |

Taxes advanced 10%, to $132,000, due to higher assessments on capital stock and increased taxes on net income.

The increase of $109,175.74 in non-operating income came principally from the favorable balance in Hire of Equipment account.

A special appropriation of $209,997.81 was made from net income. Of this amount $50,000 was paid into the Sinking Fund of Equipment Agreement Series C, and including $1,997.81 accrued interest is available for the purchase of new rolling stock; $158,000 represents the cost of Equipment Bonds Series D and F paid off during the six months, less one half of the principal refunded by 4½% Consolidated Mortgage Bonds.

## DIVIDENDS.

| Dividends in cash were paid on: | | | 6 Months Dec. 31, 1916 | | 6 Months Dec. 31, 1915 | Increase. |
|---|---|---|---|---|---|---|
| Preferred Stock | $6,000,000 | 3% | $180,000 | 3% | $180,000 | |
| Common Stock | 10,500,000 | 3% | 315,000 | 2% | 210,000 | $105,000 |
| Total | $16,500,000 | | $495,000 | | $390,000 | $105,000 |

Since the close of the fiscal year, your Board of Directors has declared semi-annual dividends of three per cent. on the preferred stock and three per cent. on the common stock, payable February 15, 1917.

## CAPITAL STOCK.

There has been no change during the year in this account. The total outstanding capital stock of the Company amounts to $16,500,000, and consists of $6,000,000 preferred stock and of $10,500,000 common stock.

## FUNDED DEBT.

Under the terms of the Sinking Funds for the redemption of Equipment Bonds, $284,000 bonds were retired, as follows: $114,000 Series D and $170,000 Series F.

Bonds held by the Fire and Pension Funds were increased $27,000. The net result is a decrease of $311,000 in the bonded debt of the Company held by the public on December 31, 1916.

In accordance with the provisions of the Consolidated Mortgage of 1907, the Trustee delivered to the Company $142,000 Consolidated Mortgage 4½% bonds, representing 50% of Equipment Bonds Series D and F retired during the year. These bonds added to those in the Treasury of the Company make a total of $1,746,000 held in reserve.

## COST OF ROAD.

Capital account has been charged during the six months with $239,578.40 for investment in road, as follows:

| | |
|---|---|
| Land for transportation purposes | $15,361.89 |
| Subway, Saxton St., Rochester, N. Y. | 9,104.74 |
| Increased weight of rails, frogs and fastenings | 69,676.14 |
| Stone ballast | 48,521.62 |
| Improving bridges and culverts | 22,332.69 |
| Shop machinery | 5,703.49 |
| Yard extension, sidings, etc. | 68,877.83 |
| Total | $239,578.40 |

The subway, Saxton St., Rochester, referred to in former reports, is now completed.

Among the important work still in progress may be mentioned the following, referred to in last report:

Strengthening of steel bridges.

Replacing of timber bridges, trestles and culverts in permanent form.

Also, the general improvement of the road with stone ballast and heavier type of rail.

## COST OF EQUIPMENT.

Expenditures were made for additions to rolling stock as follows:

| | | |
|---|---|---|
| Four flat cars built at company's shops | | $2,186.90 |
| One snow plow purchased | | 4,896.76 |
| One camp car purchased | | 4,928.07 |
| Steel underframes applied on three hundred and twenty-five freight cars | | 17,163.76 |
| Sundry other betterments, including re-classification or transfer of fifty-six freight cars and nineteen work equipment cars | | 86,808.57 |
| | | $115,984.06 |
| There was credited for equipment sold, transferred or destroyed, the following book values, a part of which, less salvage, was charged to Operating Expenses, and the balance, representing the depreciation since June 30, 1907, was charged to Depreciation Account: | | |
| Three locomotives | $19,140.30 | |
| One passenger train car | 1,171.08 | |
| One hundred and twenty-one freight train cars | 81,711.77 | |
| Four work equipment cars | 6,342.55 | |
| | | $108,365.70 |
| Making a net increase of | | $7,618.36 |

The total tractive power of engines aggregates 11,421,036 pounds, a decrease of 72,500 pounds during the past six months.

The average tractive power of each engine increased 115 pounds, being 36,372 pounds as against 36,257 pounds on June 30th, last.

The total carrying capacity of cars in freight service now amounts to 748,535 net tons, a decrease of 2,312.

The average carrying capacity or efficiency of each freight car increased .06 ton, being 43.31 tons as against 43.25 tons.

Of the cars in passenger service 45.54 per cent. are of all steel construction, and in the freight service 91.15 per cent. of the cars are now all steel or are equipped with steel underframes.

Since December 31 ten Mikado and five Mallet locomotives have been received from the builders; and contracts have been entered into for the purchase of thirty additional locomotives, to be delivered next summer, of which three are for passenger service and twenty-seven for freight and switching service.

## PASSENGER REVENUES.

The gross passenger revenue amounted to $668,733.17, an increase of 11.59 per cent., or $69,459.42 over the same period in 1915.

The average rate received per passenger per mile decreased .002 cent, being 2.162 cents as compared with 2.164.

The average distance each passenger was carried increased .66 miles, being 29.72 miles against 29.06 miles.

| | | |
|---|---|---|
| Passengers carried in the six months, 1916 | 1,040,593 | |
| Passengers carried in the six months, 1915 | 953,136 | |
| An increase of 9.18 per cent., or | | 87,457 |
| Passengers carried one mile in the six months, 1916 | 30,924,767 | |
| Passengers carried one mile in the six months, 1915 | 27,694,014 | |
| An increase of 11.67 per cent., or | | 3,230,753 |

## FREIGHT REVENUES.

The average rate received per ton per mile decreased .06 mill, being 4.59 mills as compared with 4.65 mills for the same period in 1915.

The average distance each ton was hauled increased 7.02 miles, being 163.44 miles, against 156.42 miles.

The revenue tonnage moved was as follows:

| | 6 Mos. 1916. | 6 Mos. 1915. | Increase or Decrease. |
|---|---|---|---|
| Bituminous coal | 4,848,179 | 4,457,419 | 390,760 |
| Coke | 205,118 | 237,685 | 32,567 |
| Iron ore | 445,355 | 466,575 | 21,220 |
| Pig and bloom iron | 247,942 | 238,270 | 9,672 |
| Other freight | 2,002,924 | 1,700,287 | 302,637 |
| Total | 7,749,518 | 7,100,236 | |
| An increase of 9.14 per cent., or | | | 649,282 |
| Tons moved one mile in the six months, 1916 | 1,266,597,365 | | |
| Tons moved one mile in the six months, 1915 | 1,110,629,040 | | |
| An increase of 14.04 per cent., or | | | 155,968,325 |

The result is a gain of 12.67 per cent., or $654,688 in gross freight revenue.

## EXPENSES.

Operating Expenses increased $741,003.79 or 17.29 per cent. over the same period in 1915, due to the larger volume of traffic, additional advances made in wages of employes, as well as the largely increased cost of supplies of all kinds. Also, in accordance with the policy inaugurated several years ago, there were extraordinary expenditures for rebuilding freight cars with steel underframes and bolsters, and equipping them with heavy draft gear.

The amount charged for depreciation was $237,609.09, a decrease of $345.21.

The operating ratio increased 2.57 per cent., being 74.25 per cent. against 71.68 per cent.

The percentage of each group of operating expenses to operating revenues for the past four and one half years is as follows:

| | 6 Mos. ending Dec. 31, 1916. | Years ending June 30. 1916. | 1915. | 1914. | 1913. |
|---|---|---|---|---|---|
| Maintenance of way | 13.26 | 13.81 | 13.37 | 13.49 | 14.23 |
| Maintenance of equipment | 24.04 | 23.00 | 22.53 | 20.65 | 19.74 |
| Traffic | 1.18 | 1.19 | 1.50 | 1.40 | 1.30 |
| Transportation | 33.52 | 31.91 | 33.17 | 36.15 | 32.71 |
| Miscellaneous operations | .13 | .13 | .15 | .25 | |
| General | 2.12 | 2.21 | 2.44 | 2.26 | 2.05 |
| Total | 74.25 | 72.25 | 73.16 | 74.20 | 70.03 |

The average cost per ton per mile for the six months is 3.42 mills, being an increase of .15 mill over the same period in 1915.

The average number of revenue tons carried one mile per revenue freight train mile, excluding the mileage of helping engines, decreased 21.45 tons, being 792 24 tons, against 813.69 tons.

The average number of revenue tons carried one mile per revenue freight engine mile, including the mileage of helping engines, decreased 8 tons, being 510 tons against 518 tons.

The averages for the past nine and one-half years are as follows:

| Year Ending June 30, | | Train Load. | Engine Load. |
|---|---|---|---|
| | 1908 | 530 | 371 |
| | 1909 | 597 | 400 |
| | 1910 | 638 | 420 |
| | 1911 | 635 | 430 |
| | 1912 | 647 | 439 |
| | 1913 | 710 | 462 |
| | 1914 | 694 | 454 |
| | 1915 | 707 | 477 |
| | 1916 | 786 | 502 |
| Six Months Ending December 31, | 1916 | 792 | 510 |

The average number of revenue passengers carried one mile per revenue passenger train mile for the six months is 45, being an increase of 5 over the same period of 1915.

The non-revenue traffic, not included in any of the other figures of this report, is as follows:

| | 6 Mos. Ending Dec. 31, 1916. | 6 Mos. Ending Dec. 31, 1915. |
|---|---|---|
| Number of passengers | 202,515 | 169,552 |
| Number of passengers carried one mile | 9,685,299 | 7,112,686 |
| Number of tons | 625,259 | 601,969 |
| Number of tons carried one mile | 54,883,375 | 57,065,684 |

## FIRE INSURANCE FUND.

The assets of this fund were increased $22,332.34 and now amount to $322,524.80 in interest bearing securities and cash.

## PENSION FUND.

The assets of this fund, created July 1, 1903, were increased $2,216.46 and now amount to $226,536.87 in interest bearing securities and cash.

There were 68 pensioners upon the roll on December 31, 1916, a net increase of 3 during the six months.

## GENERAL REMARKS.

In conformity with the action of the Interstate Commerce Commission and the respective Public Service Commissions of New York and Pennsylvania, the Board of Directors has changed the fiscal year of the Company so as to end with the calendar year, instead of June 30th. This report is therefore published covering the operations of the Company for the six months ended December 31, 1916, and comparisons made with the figures for the six months ending December 31, 1915. Future reports will cover the years ending December 31st.

The Ontario Car Ferry Company, Limited, paid a dividend of 2½% for the six months ended June 30, 1916. The sum of $6,242.50 received on the $249,700 of this Company's stock was credited to Non-operating Income Account.

The field and office work preparatory to the valuation of your lines is now well in hand. The cost of this work during the past six months was $10,457.28, making the total expenditure to December 31, 1916, for this purpose, $31,590.11.

Effective November 1, 1916, Mr. Thomas F. Brennan, formerly General Manager, was made Vice-President, and Mr. Edgar F. Robinson, Chief Engineer, was promoted to General Manager.

The acknowledgments of the Board are renewed to the officers and employes for their faithful and efficient service.

By order of the Board.

WILLIAM T. NOONAN,
President.

Rochester, N. Y., February 21, 1917.

## PROFIT AND LOSS ACCOUNT.

December 31st, 1916.

CREDIT.

| | | |
|---|---|---|
| Balance Surplus, June 30, 1916 | | $3,965,754.01 |
| Credit Balance, transferred from Income Account (page 22) | | 863,855.71 |
| Unrefundable overcharges | | 2,006.25 |
| MISCELLANEOUS CREDITS— | | |
| Adjustment of old accounts | $141.53 | |
| Unclaimed wages, etc. | 700.89 | |
| Withdrawn from Pension Fund | 1,392.24 | |
| Miscellaneous credits | 1.00 | |
| | | 2,235.66 |
| Total | | $4,833,851.63 |

DEBIT.

| | | |
|---|---|---|
| Dividend appropriations of surplus: | | |
| Preferred stock (No. 46) 3% on $6,000,000 payable August 15, 1916 | $180,000.00 | |
| Common stock (No. 33) 3% on $10,500,000 payable August 15, 1916 | 315,000.00 | |
| | $495,000.00 | |
| Premium on funded debt retired | 4,180.50 | |
| Value of abandoned road-bed | 676.13 | |
| MISCELLANEOUS DEBITS— | | |
| Adjustment of old accounts | 3,659.85 | |
| Total | | 503,516.48 |
| BY BALANCE SURPLUS, December 31, 1916 (page 15) | | $4,330,335.15 |

## COMPARATIVE INCOME ACCOUNT.

OPERATING REVENUES.

| | SIX MONTHS ENDING DEC. 31, 1916. | SIX MONTHS ENDING DEC. 31, 1915. | INCREASE OR DECREASE. |
|---|---|---|---|
| FREIGHT— | | | |
| Coal | $3,615,227.50 | $3,199,349.95 | $415,877.55 |
| Coke | 188,140.40 | 215,654.12 | —27,513.72 |
| Merchandise | 2,016,992.46 | 1,750,668.29 | 266,324.17 |
| Total | $5,820,360.36 | $5,165,672.36 | $654,688.00 |
| PASSENGER | 668,733.17 | 599,273.75 | 69,459.42 |
| OTHER TRANSPORTATION— | | | |
| Excess baggage | 4,186.04 | 4,764.30 | —578.26 |
| Parlor and chair car | 7,228.90 | 5,978.75 | 1,250.15 |
| Mail | 28,580.94 | 26,551.30 | 2,029.64 |
| Express | 50,000.00 | 50,000.00 | ..... |
| Other passenger train | 2,451.04 | 2,907.48 | —456.44 |
| Milk | 12,940.50 | 9,839.27 | 3,101.23 |
| Switching | 81,854.47 | 56,426.81 | 25,427.66 |
| Special service | 324.90 | 285.52 | 39.38 |
| Total | $187,566.79 | $156,753.43 | $30,813.36 |
| INCIDENTAL— | | | |
| Dining and buffet | 6,048.67 | 5,494.56 | 554.11 |
| Station, train and boat privileges | 2,176.74 | 2,060.78 | 115.96 |
| Demurrage | 18,860.00 | 5,130.49 | 13,729.51 |
| Ganson St. Docks | 53,658.80 | 41,394.60 | 12,264.20 |
| Sundry sources | 11,344.19 | 2,232.55 | 9,111.64 |
| Total | $92,088.40 | $56,312.98 | $35,775.42 |
| TOTAL OPERATING REVENUES | $6,768,748.72 | $5,978,012.52 | $790,736.20 |

OPERATING EXPENSES.

| | | | |
|---|---|---|---|
| Maintenance of way and structures | $897,548.68 | $969,576.98 | —$72,028.30 |
| Maintenance of equipment | 1,627,387.62 | 1,324,465.41 | 302,922.21 |
| Traffic | 79,967.47 | 69,923.62 | 10,043.85 |
| Transportation | 2,268,545.91 | 1,784,779.81 | 483,766.10 |
| Miscellaneous operations | 8,975.81 | 7,063.60 | 1,912.21 |
| General | 143,382.73 | 128,995.01 | 14,387.72 |
| TOTAL OPERATING EXPENSES | $5,025,808.22 | $4,284,804.43 | $741,003.79 |
| NET OPERATING REVENUE | $1,742,940.50 | $1,693,208.09 | $49,732.41 |
| TAX ACCRUALS | 132,000.00 | 120,000.00 | 12,000.00 |
| UNCOLLECTIBLE REVENUES | 1,354.26 | 38.27 | 1,315.99 |
| OPERATING INCOME | $1,609,586.24 | $1,573,169.82 | $36,416.42 |
| NON-OPERATING INCOME— | | | |
| Hire of freight cars | 383,243.94 | 297,447.53 | 85,796.41 |
| Rent from other rolling stock | 5,243.55 | 7,291.02 | —2,047.47 |
| Rents—Joint facilities | 87,598.96 | 77,126.91 | 10,472.05 |
| Rents—Miscellaneous | 12,967.78 | 2,699.39 | 10,268.39 |
| Dividends on stocks owned | 6,242.50 | 6,242.50 | ..... |
| Income from securities, loans and accounts | 26,489.60 | 25,346.13 | 1,143.47 |
| Release of premium on funded debt | 3,430.07 | ..... | 3,430.07 |
| Miscellaneous | 197.16 | 84.34 | 112.82 |
| TOTAL NON-OPERATING INCOME | $525,413.56 | $416,237.82 | $109,175.74 |
| GROSS INCOME | $2,134,999.80 | $1,989,407.64 | $145,592.16 |

DEDUCTIONS FROM GROSS INCOME.

| | | | |
|---|---|---|---|
| RENTS—FOR LEASED ROADS— | | | |
| Allegheny & Western Railway | $136,000.00 | $136,000.00 | ..... |
| Clearfield & Mahoning Railway | 43,250.00 | 43,250.00 | ..... |
| Mahoning Valley Railroad | 7,500.00 | 7,500.00 | ..... |
| | $186,750.00 | $186,750.00 | ..... |
| For rolling stock other than freight cars | 756.15 | 281.79 | $474.36 |
| Joint facilities | 159,854.83 | 152,802.06 | 7,052.77 |
| Miscellaneous | 7,893.00 | 9,095.45 | —1,202.45 |
| Total rents | $168,503.98 | $162,179.30 | $6,324.68 |
| INTEREST ON FUNDED DEBT— | | | |
| First Mortgage Bonds— Roch. & Pitts. Rd. | 39,000.00 | 39,000.00 | ..... |
| Consol. Mort. Bonds— Roch. & Pitts. Rd. | 117,600.00 | 117,600.00 | ..... |
| General Mort. Bonds— B., R. & P. Ry. | 110,675.00 | 110,675.00 | ..... |
| Consol. Mort. Bonds— B., R. & P. Ry. | 218,520.00 | 218,520.00 | ..... |
| First Mortgage Bonds— L., P. & C. Rd. | 8,750.00 | 8,750.00 | ..... |
| Equipment Agreements | 201,523.51 | 225,643.75 | —24,120.24 |
| Total | $696,068.51 | $720,188.75 | —$24,120.24 |
| INTEREST ON UNFUNDED DEBT | 646.78 | 2,661.09 | —2,014.31 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | $1,051,969.27 | $1,071,779.14 | —$19,809.87 |
| NET INCOME | $1,083,030.53 | $917,628.50 | $165,402.03 |

DISPOSITION OF NET INCOME.

| | | | |
|---|---|---|---|
| APPROPRIATIONS— | | | |
| Pension Fund | $3,509.14 | ..... | $3,509.14 |
| Insurance Fund | 5,667.87 | ..... | 5,667.87 |
| New Equipment | 51,997.81 | $50,910.91 | 1,086.90 |
| Retirement of Equipment bonds | 158,000.00 | 171,000.00 | —13,000.00 |
| DIVIDENDS— | | | |
| PREFERRED STOCK— (No. 44) 3% on $6,000,000, payable August 15, 1915 | ..... | 180,000.00 | —180,000.00 |
| COMMON STOCK— (No. 31) 2% on $10,500,000, payable August 15, 1915 | ..... | 210,000.00 | —210,000.00 |
| Total Appropriation of Income | $219,174.82 | $611,910.91 | —$392,736.09 |
| INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS | $863,855.71 | $305,717.59 | $558,138.12 |